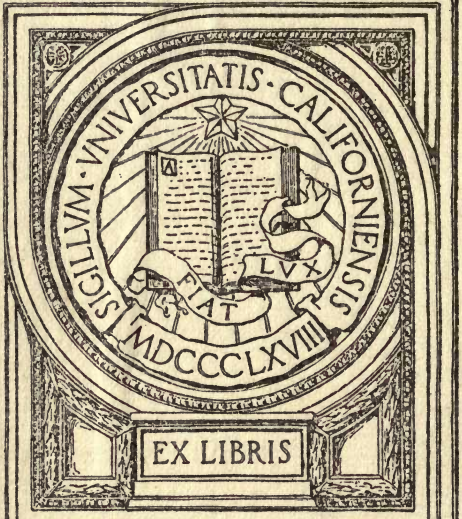
SB
205
C64R6

YB 46479

THE
GEORGE WASHINGTON YORK
LIBRARY OF APICULTURE



The Truth About Sweet Clover

Its Value for Honey, for Plowing Under, as Fertilizer of the Soil, and Food for Horses, Cattle, Swine, Sheep, etc.; and last, but not least, as a Valuable Plant for Introduction of Nitrogen-gathering Bacteria.

THE A. I. ROOT COMPANY
MEDINA, OHIO

Table of Contents.

Alfalfa grown with sweet clover 91
Alkaline lands, sweet clover on 5, 51
Alkaline soils of California and Colorado 39
Ancients, sweet clover known to 76
Australia, sweet clover in 29
Bare spots filled with sweet clover 74
Bloating, remedy for 80, 83, 84
Calves and cattle, for 11, 25, 36, 38, 46
Cattle, fattening on sweet clover .. 11, 55, 57, 58, 67, 70, 78, 80, 84, 91
Cattle feeding on sweet clover 66
Coverdale, Frank's experiments 65
Drainage canal, sweet clover on banks of 18, 21
Dry regions, for 37
Enriching ground with sweet clover 54
Feed, 10 lbs., per square yard 73
Fertilizer, value of for 88
Forage plant in Alabama 28
Forerunner of alfalfa 57, 83
Germany, sweet clover in 50
Gravel-pit, sweet clover in 44
Ground from the bottom of a well produces sweet clover 26, 27
Ground, fitting for corn 70, 74
Ground, making fertile with sweet clover 23
Ground, preparing for alfalfa 76
Ground, preparing it for seed 38
Gullies and washouts, to fill 63, 82, 89
Hay, for 6, 7, 25, 34, 35, 56, 58, 64
Hay, when to cut 87, 90
Hogs, fattening on sweet clover 70
Honey from sweet clover 5, 9, 39
Honey produced from 88
Horses and colts, for 6, 13, 22
Humus, furnishing ground with 70
Inoculating land for alfalfa 53
"John the Baptist" of alfalfa 94
King Island, sweet clover in 29, 30
King Island, transforming 31
Land likely to be overflowed 26
Land, making it productive 40
Land, sweet clover for 81
Land, value for 86
Lime for sweet clover 87
Milk and butter, sweet clover for 22
Miller, Dr. C. C., notes from 46
Mulch for strawberries 56
Nitrogen bacteria 10
Nitrogen nodules 60
Oats sown sweet clover with 95
Origin of 45
Peas sown with sweet clover 24
Pigs, for 23, 24, 38, 93
Plowing under to grow potatoes 11, 43

(Continued on page three of cover.)

The Truth About Sweet Clover

Its Value for Honey, for Plowing Under, as a Fertilizer of the Soil, and Food for Horses, Cattle, Swine, Sheep, etc.; and last, but not least, as a Valuable Plant for the Introduction of Nitrogen-gathering Bacteria.

A Compilation of Articles that have Appeared in Gleanings in Bee Culture from 1905 to 1910; also Clippings from Various Agricultural Periodicals Scattered all over Our Land.

C Root, Amos Ives

THE A. I. ROOT COMPANY.
MEDINA, OHIO
1910

20m5-10

UNIV. OF
CALIFORNIA

SB205
C64R6

Gift of G. W. York.

INTRODUCTORY.

There has been so much discussion in regard to sweet clover for years past that I have thought best to present in this booklet some testimonials from bee-keepers and others from many widely separated localities. There are certain people who will have it that sweet clover is a noxious weed, and that its spread should be restrained by law; in fact, there have been laws and ordinances passed requiring farmers and others to mow it down along the roadsides; but at the present time I believe our best agriculturists regard it as no more a weed than many of the other clovers; and it is just as easy to eradicate it by plowing it under. Our Ohio Experiment Station has at different times expressed its opinion in regard to it; and below is a statement recently furnished us from the present able director, Professor Thorne:

SWEET CLOVER, MAY IT UNDER ANY CIRCUMSTANCES BE CLASSED AS A NOXIOUS WEED?

OHIO AGRICULTURAL EXPERIMENT STATION,
WOOSTER, OHIO, Feb. 23, 1905.

Mr. Root:—When you get out a new circular I wish you would cut out the statement that this station has ever classed sweet clover as a noxious weed. Away back in 1877-78, I called attention, through *Farm and Fireside*, in an article which was copied generally in the agricultural press, to the fact that this plant grows only where nothing else will grow, and appears to be designed as a renovator of exhausted soils. I have never permitted it to be classed as a noxious weed while in control of this station.

CHAS. E. THORNE, *Director.*

Just at present sweet clover is coming out more prominently than ever before, because it is found to be one of the best of the legumes for introducing the nitrogen bacteria that have the little nodules on the roots of the plants. We have not space in this circu-

497822

lar to go into the matter of the "nitro culture;" but as we go to press it promises to be one of the greatest achievements in the way of modern agriculture; in fact, it has been termed, in a vein of pleasantry, "a process by which the up-to-date farmer may carry his fertilizer in his vest pocket." Our experiment stations have for many years decided that sweet clover is one of *the best* clovers to plow under for the purpose of enriching unfertile or worn-out soils.

As an indication of the change in public opinion in regard to sweet clover, I may say that, for some time past, the price of sweet clover seed has been steadily advancing. At the present time the call is greater than ever before; in fact, we are sold out of seed as we go to press, and have advertised north, south, east and west for a new supply if it can be had anywhere in the United States.

May 1, 1910. A. I. Root.

IMPORTED SWEET-CLOVER SEED.

Since the above was put in type I am informed that a large part of the sweet-clover seed now on the market is imported from foreign countries; and in order to test this seed I have taken some samples from sacks holding several hundred pounds, and sowed them in our little greenhouse. I am glad to tell you that not only does almost every seed germinate, but the plants are up so as to be visible in just three days from the time of sowing. These imported seeds all have the hulls removed; and what I have been enabled to get hold of is remarkably clean, and free from weed seeds of any sort, which can hardly be said of most of the seeds produced in the United States, and sold with the hulls on. And, by the way, seeds sown with the hulls on are much slower in germinating. At the present writing it is my impression that we should, as far as possible, use seeds with the hulls taken off. The cost is three to five cents more per pound; but as you get many more seeds in a pound it will probably be as cheap, or cheaper, in the end.

June 1, 1910.

Testimonials from all over the World in Regard to the Value of the Sweet-clover Plant.

SWEET CLOVER—WILL FARM STOCK EAT IT?

Dear Sir:—I have sown sweet clover in a small way several times, but my sheep (about 100) always eat it so close that it dies. I will try to keep the sheep off.

Dutch, Va., July 3. W. C. JACKSON.

SOWING THE SEED WITH OATS.

I have three acres of sweet clover, the white variety, which I sowed last year with oats. It is a fine growth, and has been blooming, and the bees have been literally swarming on it for several weeks. It is seeding very heavy, and is free from any thing else. HENRY STEWART.

Prophetstown, Ill.

SWEET CLOVER IN ILLINOIS

Sweet clover is one of the best honey-plants that I have. I am glad that some people don't know how to kill it. I have no trouble in killing it where I don't want it to grow. Stock eat it here. When pastures are short the stock are herded on the road, and they eat it as quickly as anything else.

Sheffield, Ill. A. L. KILDOW.

SWEET CLOVER FOR BEES AND FARM STOCK.

I should like to say a few words for sweet clover. I finished extracting on the 15th. I got 2500 lbs. of sweet-clover honey from 60 hives. There is but little if any white-clover honey mixed with it. I have thirty acres of this sweet clover on my place. It is good cattle pasture in the early spring and late fall.

S. R. FLETCHER.

Onawa, Ia., Aug. 16, 1906.

SWEET CLOVER FOR ALKALI SOILS.

We have nothing so valuable here as sweet clover to enrich alkali lands. Wherever it has grown for

two or more years it has left a rich spot. I will sow it on all my alkali land this spring that I can get water on, as it needs irrigation here the same as alfalfa.

A. A. BROWN.

Gazelle, Cal., Jan. 30, 1899.

SWEET CLOVER FOR COWS.

What kind of cattle does Mr. Sawyer have, anyhow? If I had a cow that would not eat sweet clover after I had kept her six months I would certainly dispose of her. I have sweet clover growing in my pasture, but I have as yet to see it bloom. The cattle keep it eaten down all the time.

JAS. PRATT.

Cumminsville, Neb., Dec. 31, 1899.

PREFERRED TO ALFALFA BY A HORSE.

I cut a crop of sweet clover this year, threshing it for seed, and giving some of the straw to the horse. I found it would pick out the old harsh sweet-clover straw in preference to good alfalfa hay. Of course, the leaves were all threshed off, leaving just the stems; but the horse was very eager for it, while cows would not touch it. The hay was not cut until the plants were dead and yellow.

D. E. ROSE.

Douglas, Kan., Sept. 15, 1903.

THE VALUE OF SWEET CLOVER AND OATS FOR HAY.

I have a correspondent in Alabama who owns a farm of 640 acres, who grows 160 acres per year of oats and sweet clover, and cuts the combination crop expressly for hay. He has blooded stock (cattle) and keeps no bees. He says the hay when baled and marketed in Birmingham, Ala., sells readily at $15 per ton.

M. M. BALDRIDGE.

St. Charles, Ill., Aug. 10, 1906.

SWEET CLOVER—WHAT THE ILLINOIS EXPERIMENT STATION SAYS OF IT., ETC.

I send herewith circular No. 116, Illinois Experiment Station, which refers to sweet clover as one of the most useful legumes for green manuring.

I have six acres of sweet clover which was sown in 1907 with oats. It stands knee high now, and the growth would be about all a plow would want to turn under. On a portion of the piece I cut a ton per acre off from it last fall, and put it up for hay.

HENRY STEWART.

Prophetstown, Ill., July 1, 1908.

SWEET CLOVER—DOES IT WINTER KILL?

The seed you sent me I sowed on clay land last spring, 1906. It made a good stand last summer. It is almost 3 ft. high now, and looks fine, but it winter-killed in spots, making it uneven. I think it would be a fine clover for the South; but I fear it winter-kills too badly for the North. CLARENCE NEAL.

Lanesboro, Ind., Aug. 15, '07.

We have never had any trouble with winter-killing when the seed was sown tolerably early—say before July. When sown in the fall it has sometimes failed to winter over. But the seed that drops off and sows itself always makes a stand with us, especially along the railroad tracks where the hard clay subsoil is piled up in heaps. These heaps are covered with a dense rank growth of sweet clover year after year, where it is not molested, and where cows and other stock can not get a chance to eat it off.

SWEET CLOVER WINTER-KILLING, ETC.

Perhaps only one-fifth of the area that I have in sweet clover was killed by the frost. While there are but very few fields of red clover here in Grant Co. but were entirely destroyed by the severe winter of 1906, I think it safe to say that sweet clover can stand more heaving of frost than either red, alfalfa, or alsike clover. Yes, my sweet clover grew this summer from 3 feet high to—well, the tallest plant was 8 feet high, and that on pure clay ground. There were large flies, wasps, hornets, and numerous other insects on the fragrant bloom, and among them the bees with their merry labor-song. C. A. NEAL.

Jonesboro, Ind., Nov. 15, 1907.

SWEET CLOVER; CAN IT BE SOWN AMONG CORN WHEN CULTIVATING THE LAST TIME?

Mr. Root:—Replying to your query, June 15, I would say I sowed sweet clover and crimson clover in corn about July 28 last year. It was not a fair test, as a terrific storm washed much soil and seed away shortly after sowing. The rest sprouted; but drouth prevented summer and fall growth. The first heavy frost cut down sweet clover; but crimson clover was not hurt, and grew somewhat, and stayed green practically all winter, but plants were very small. Its several roots prevented heaving killing, and it did well this spring. Large quantity of sweet clover heaved and died, except where roots were over 8 inches. When the tip remained in the ground it soon caught up with crimson clover in spring. It seemed that seed where pressed into soil sprouted best.

GENESIS FARM.

Greencastle, Ind., June 25.

SWEET CLOVER; WHY IT WON'T GROW ON CULTIVATED GROUND.

I notice, page 1048, the failure which Dr. Miller and A. I. Root had in getting a good stand of sweet clover on cultivated ground. I think I can tell you where they failed.

Sweet clover does not grow on cultivated ground, for two reasons. First, because in such ground the soil is so loose that it freezes out and drowns out. I saw this proven by some cultivated land which had lain idle for three years. The first and second year the sweet clover took hold, but always died out. The third year it wintered fairly well, and will probably do better in 1907.

The second reason is that the original stalk lives two years; hence if it is not allowed to go to seed it will be gone at the end of two years.

RAY MCQUISTON.

Independence, Kan., April 1, 1907.

IMPROVING OUR BEE PASTURES.

On a visit to Mr. Salisbury, who resides right in the city of Syracuse, N. Y., he showed me two hives

from which he has taken 532 pounds of surplus the past season, and surely his location would naturally be much poorer than almost any spot outside of a city. But looking over the ground there, what do we find? Vacant lots and parks all around that city are covered with a rank growth of sweet clover which commences to bloom in June, and keeps at it until frost. Whether this came about by accident or design I can not say; but certain it is that it is an enviable position for any bee-keeper, and one which might easily be imitated; for when once started this plant readily seeds itself and spreads with great rapidity, and we can scarcely imagine a locality where there are not many vacant strips and corners which might as well be growing sweet clover as other weeds which are not honey-producers.

May 1st, 1909.

AMOUNT OF SWEET-CLOVER SEED TO SOW TO THE ACRE.

Mr. Root:—I believe you are advising wrongly when you suggest sowing 4 lbs. of hulled or 8 to 10 of unhulled sweet-clover seed per acre, for the reason that, at any time of the year you may sow it, there is only a part of it that will germinate the same season it is sown, the rest not starting till the next season. I have sown at least 25 or 30 acres, and put on not less than 8 to 10 lbs. of unhulled seed and sowed it early in the spring too, and I have never been able to get a good stand the same spring, and the next spring the rest of the seed would come up, and for another year I would still have only a partial stand, so you see that leaves me until the third year before I can have a perfect stand, as the seeding the second year seeds itself.

I believe we should sow not less than 20 lbs. of unhulled seed, or 12 to 15 of the hulled per acre; then you may rest assured you will get a stand.

I have sown several thousand acres of alfalfa, and the ones that are successful in getting a stand are those that are not afraid to put on at least 15 to 20 lbs. per acre, and then your ground needs to be in perfect order. I sowed about three acres last spring,

and put on about 20 lbs. of the unhulled seed, and I got a fine stand. Enough will come up from the seed again this spring to give me a good stand next spring. R. L. SNODGRASS.

Augusta, Kan., Feb 9, 1909.

SWEET CLOVER AS A FOOD FOR STOCK.

Last week, seeing in the cornfield sweet clover over two feet high in bloom I thought of a writer who said it would not grow in cultivated fields. The large plant which I send in a separate inclosure has grown from seed which has germinated since July 29, when the corn was last cultivated. I also send two young plants which have grown from seed since our first rain, Oct. 14. The whole field was plowed late last spring, and that part which is now covered with a dense growth of young clover, being above the irrigation line, was not planted. This part of the field was free from clover last year, and the seed must have lain dormant two years. I consider it a good plow-under crop. Today I counted over 100 nodules on one plant. This coming season I hope to save enough seed to plant ten acres, and the following spring plow it under for corn-planting. Last week I gave some sweet clover to a pen of young fatting hogs which had never eaten any. They were all very fond of it. Some horses and cattle do not relish it *at first*, but, like human beings, have to acquire an appetite for some foods. I well remember my first attempt to eat an olive. Now you can scarcely feed me too many. If you have a pet Jersey cow you wish to have love you, and give you a good quality of rich milk, give her a good feed of sweet clover at milking time; but too heavy feeding with it will give the milk a peculiar flavor.

Descanso, Cal., Dec. 5, 1908. E. P. ST. JOHN.

SWEET CLOVER.

For several days I have been staking our cow out in the alfalfa pasture in order to give her a little green food. It would hardly be safe, you know, to let her run loose and eat her fill. Yesterday I tied her

to the fence. There is a sprinkling of sweet clover all along this edge of the field. What did the misguided creature do but pick out and devour every stalk of sweet clover within reach before she would touch any of the alfalfa! Surely she ought to have known better! Those who hold that sweet clover is not a fit food for stock are invited to labor with her and convince her of the error of her ways. where it was unmolested. J. A. GREEN.

Grand Junction, Col., June 1, 1906.

SWEET CLOVER; ITS VALUE AS A FERTILIZER.

I have about six acres of sweet clover, not as thick as I wish, but I hope to see it better in the future, and I cut the sweet clover along the road by my place.

There may be States in which sweet clover is classed as a noxious weed, and so that it would be unlawful to raise it, even on our own land. If this is the case, it would not look well to advise raising it there. I have found that sweet clover is worth more for enriching the soil than it is for honey.

I dug a few potatoes yesterday where there was sweet clover last year, and found double the yield out of the same number of hills on the same soil. Where the sweet clover grew, there was no manure last year; and where the sweet clover was not, I had a coat of manure last season. Along the railroad and highways sweet clover does not last more than a few years. It will grow where no plant will, and then other plants take its place. I have in mind a spot where the soil was removed for an embankment —*3 or 4 feet of top* soil, some one sowed sweet clover there, and after a few years of sweet clover other grasses have taken its place. The sweet clover produces the humus to bring about the result, and this spoils the soil for its own growth.

A. CHAS. ARMSTRONG.

Warner, N. Y., Aug. 17, 1907.

Score another for sweet clover. The honey yield was very light here in the fore part of the season; but in August the sweet clover began to give down,

and since then some localities have secured a very good crop, a few a really exceptional crop of nice honey from that source. At this date, Sept. 13, the flow still continues good.

Dr. Miller is right in saying that sweet clover is not a desirable lawn grass, and the editor is probably right in the belief that it could hardly get started on a lawn that was properly cared for. It is remarkable, though, what a dwarf can be made of the plant by close pruning. I have seen places where the roadside cattle had kept it closely nipped, where the ground was covered with a close mat of it not over two or three inches high, yet blooming profusely. A lawn of it kept in that condition would be really pretty. But one would hardly recognize it as a relation of the six or eight foot stuff that grew where it was unmolested. J. A. GREEN.

Grand Junction, Colo., Oct. 15, '06.

THE EXPERIENCE OF A FARMER WHO GROWS IT FOR HIS STOCK; HIS CATTLE WILL TAKE IT IN PREFERENCE TO OTHER CLOVERS.

It is a common thing to hear people say that nothing will eat sweet clover. Such people are either drawing on their imagination or their experience is limited. Now, I do not say that stock will eat sweet clover when there is plenty of grass, but my calves did that very thing this summer, and kept it eaten down all fall. To try sweet clover further as a forage-plant I turned my calves into a ten-acre field of sweet clover with two acres of English clover on one side of the field. I fully believe they liked the sweet clover as well as the English.

There is no use for any one to say that nothing will eat sweet clover, for I have seen my calves eating it; and when I turned them into that ten-acre field they quit coming up for their feed. It is now Nov. 19. My sweet clover is still green, and we have had freezing weather here. The ground had been frozen hard.

There are three times in a year when sweet clover is a good forage-plant—early spring, before grass comes on; midsummer after grass dries up, and late

fall. I am not sowing sweet clover alone for bees, but am sowing for both bees and stock; and I can say from experience that they both do well on it. After this I expect to sow my thinnest land to sweet clover, as I believe it to be a great land-builder.

There is one thing more that I wish to mention about sweet clover. I fully believe that the bark on second-year's sweet clover will make the best of ropes.

Velpen, Ind., Nov. 19. BY W. T. DAVISON.

[The following, which tells how sweet clover behaves in Montour Co., Pa., from the *American Agriculturist*, is along the same line:]

I have been reading several articles in *American Agriculturist* on the value of sweet clover, *Melilotus alba*. Some writers say it is not eaten by stock. Others say it makes good hay when cut and stored in layers between layers of other hay. We have it growing in every by-place along the roadside, on stone piles and in cultivated fields. It will grow where no other plant can live. On poor, barren land it grows 3 to 6 feet high.

I selected one stalk having 13 branches measuring 4 to 8 feet long, grown from a single seed. The root of this stalk was 3 feet 4 inches long with large nodules. It starts to grow in the spring earlier than any of the other forage plants. By April 10 to 15 it is from 4 to 8 inches high, and eaten with relish by cattle and colts. Our cattle eat it all summer; but when allowed to grow it soon becomes woody. The cattle then eat only the blossom ends of the branches It is not easily cured for hay. It is very sappy; and, before it cures, the leaves all drop off, leaving only the stem.

I have a piece of sweet-corn and pumpkins growing now in an old peach orchard. The ground was very poor, and for three years it has been covered with sweet clover. I removed the old stalks that grew the preceding year, and plowed it May 16. The clover was then 15 inches high, and three horses could scarcely turn it. It lay until June 21, when I marked and planted it. The sod rotted completely, and the corn proved the best I ever grew.

M. S. BOND.

Articles by Mr. and Mrs. Amos.

INCREASING THE PASTURAGE BY SOWING SWEET CLOVER.

THE WHITE AND YELLOW VARIETIES.

Last October there appeared in GLEANINGS an illustrated article by John Bodenschatz telling how much

he had increased his honey yield by scattering sweet clover seed on waste land in his vicinity. GLEANINGS called for a show of hands from those who could give testimony along that line. My own experience is similar to his, in a smaller way, as I have fewer bees. My yield of honey is much greater, and the quality of the honey is very much improved since sweet clover has become an appreciable factor in the honey crop.

Mr. B. did not say what kind of sweet clover he had; but it is not difficult to infer that his is the white kind, since he spoke of its following white clover. That is the kind to have for those who want it to follow white clover. There is so little white clover here that it cuts no figure in honey production, so I have been busy every spring increasing my acreage of the yellow kind. I grow that instead of white clover. The first few blossoms usually open near the end of May, and it yields freely all through June. It slackens up in its blooming then; but after maturing a big crop of seed it begins to bloom again. Putting the time a month later, one might say the same of the white as I have said of the yellow. The bee-keeper here who has abundance of these two clovers is practically independent of any other honey flora, since they supplement each other, and together yield honey until killed off late by freezing weather.

The honey obtained here from sweet clover is fine, and I have no trouble at all in selling it at top prices, both comb and extracted. I have these clovers growing on my own farm here around the orchard, and wherever there is a piece of ground available. And I have also some flourishing patches along the roadsides.

Sweet clover bears transplanting well if taken in early spring. I like to start out armed with a spade and a pailful of plants as well as seed when I try to establish it in new places. I have spent hours that way, and thought the time well spent.

Comstock, Neb., July 1, 1906. MRS. A. L. AMOS.

[Our own observation corroborates the above, to the effect that yellow sweet clover is three or four

weeks earlier than the white. Right under our office window are some thrifty sweet-clover plants two or three feet high. While the white shows no blossom-buds at all a stock of yellow is in full bloom.—A. I. R.]

SWEET CLOVER.

WHY IS NOT THE YELLOW VARIETY MORE WIDELY KNOWN?

The little I have written in GLEANINGS started a small avalanche of letters of inquiry to which I have been trying to do justice. Some of these letters were quite interesting. For instance, I got one from California, in which the writer said:

> Some 25 years ago I was engaged in the hardware and seed business at Paola, Kan., and for some customer I wrote to an eastern seed-house for a little each of the white and yellow Bokhara clover. They were identical in habit, but I thought the yellow contained more nectar, as the bees were almost crazy for it, and it bloomed from early till late. I now conclude that this is the same as sweet clover referred to. Do you know?

I wonder what became of that yellow sweet clover started so long ago near Paola, Kan. I wonder how it comes that the white sweet clover is known all over and the yellow is not.

Its great merit was recognized in some quarters years ago.

A very interesting letter from the late Mrs. L. Harrison was read by Mr. York at the Illinois State Bee-Keepers' convention, held in Chicago in 1896. She said of *Melilotus officinalis*, "This is well known, and gaining in reputation as a forage-plant and for bee-pasture."

When D. A. Jones, of Canada, attended the sessions of the North American Bee-kepers' Association he advocated the merits of what he called Bokhara clover, first, last, and all the time. Prof. Cook took a plant in his hand that Mr. Jones brought with him, and, standing up smilingly, said, "Look at its root. It s only sweet clover." So it was: but it was *Melilotus officinalis*—the yellow variety. See *American Bee Journal*, 1897, page 34. Ten years ago!

Why has it not made greater headway to recognition? That's what puzzles me.

I have looked in many "bee-books," manuals of bee-keeping, to find among the honeyplants *Melilotus alba* alone, instead of being accompanied by its twin-sister, *Melilotus officinalis.* It is mentioned in the A B C but hardly gets justice. I confidently believe the next edition will have more to say.

I want to see merit find recognition. My experience with the yellow sweet clover is that it is far ahead of the white as a forage-plant. The white does not hold its own when stock feed on it, but the yellow does. Dr. Gandy, of Richardson Co., this State, has had yellow sweet clover for many years, and attributes to it much of his success as a honey-producer. Mrs. Lambrigger, of Knox Co., Neb., wrote of it with enthusiasm some ten years ago.

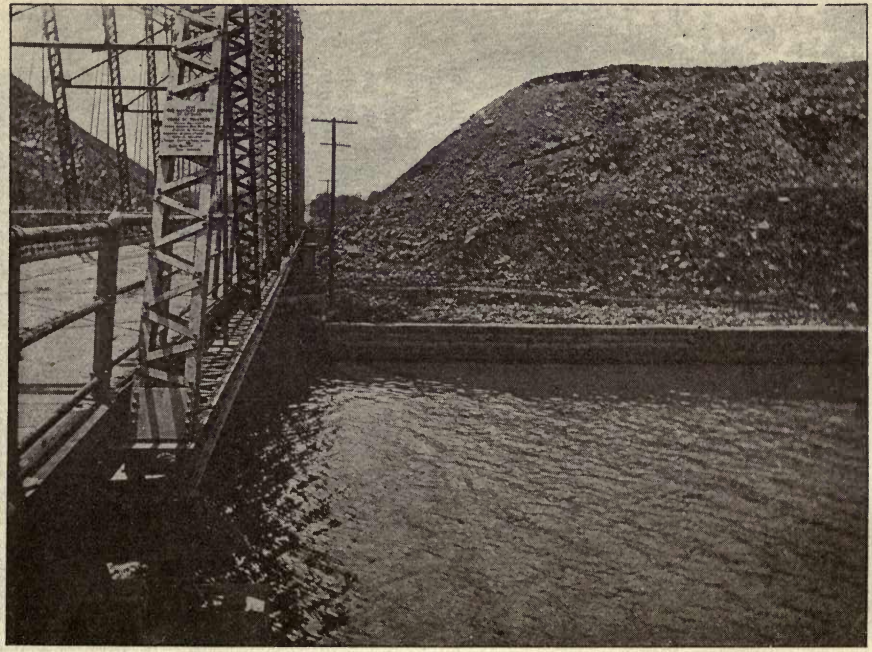
Comstock, Neb., May 1, 1907. MRS. A. L. AMOS.

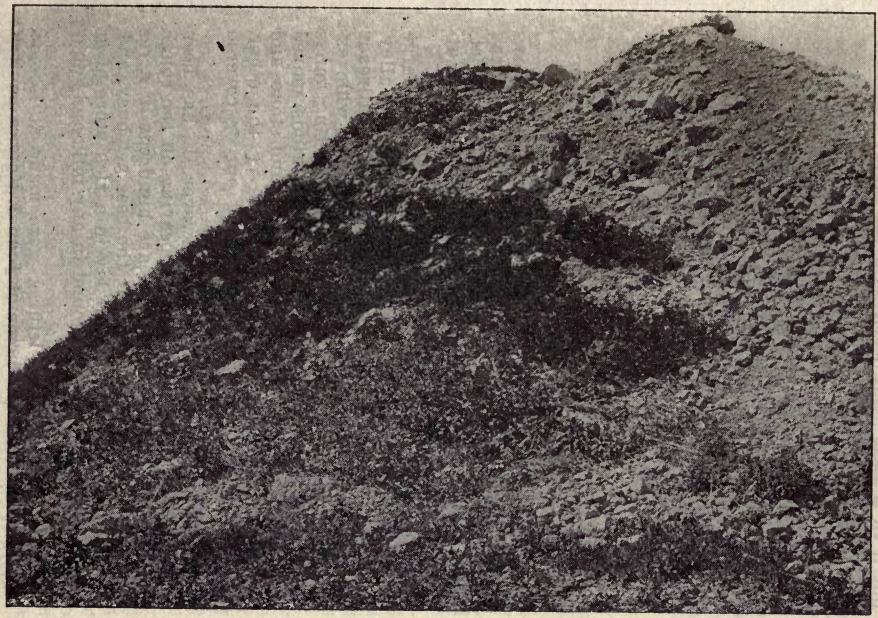
HARVESTING SWEET-CLOVER SEED.

When, in my enthusiasm, I commenced to write of yellow sweet clover as a honey-plant it was without the slightest intention of going into the seed business; but so many inquiries came to hand asking if I could supply seed or tell where it might be obtained, that I began to study whether I could not do something toward supplying the demand. I hit upon a plan of harvesting the seed in a small way, which may be of interest to those who would do likewise.

I have the clover cut with a mowing-machine when the seed has partly ripened. I have this cutting done after a rain, or in the morning when the dew is on it, as the seed does not shake off so easily when wet. It is allowed to lie for a few days to finish ripening, when the girls and I "go for it" as shown in the picture.

We spread the buggy canvas on the ground, and pile on the clover. We do this in the morning when it is wet, and allow it to lie till late afternoon, when it is thoroughly dry and yields readily to the feet and sticks of the young harvesters. After a vigorous pounding and tramping we find from ten to twenty





High bank of the Chicago Drainage Canal, showing vegetation, mostly white sweet clover.

pounds of seed on our canvas. We sift it twice and put it in a sack. Our work with the clover stretches over a week or more, and we have no very large quantity then, but enough to supply many bee-keepers who want only a little to try it.

If one wants a clover-field to be good year after year as I do, I consider it very important to remove the greater part of the seed. If this is not done it sows itself too thickly. In harvesting as we do, there is always enough left to seed the ground nicely for another year.

Comstock, Neb., Nov. 15, 1907. MRS. A. L. AMOS.

SWEET CLOVER.

HOW THIS HONEY-PRODUCING PLANT GROWS ON THE BANKS OF THE CHICAGO DRAINAGE CANAL.

Sweet clover, of the white variety, is found growing in such profusion on the towering banks of the Chicago drainage canal, between Chicago and Joliet, that apiarists are much encouraged in their attempts to produce honey in paying quantities.

Before this great sanitary canal was built, a large amount of wild clover grew in the Des Plaines Valley. It all but covered the right of way of the railroads traversing the region, and spread out to a wide expanse of prairie land. When the constructing gangs with their ponderous machinery of all kinds moved down the valley, digging out the earth and stone, and piling it mountain high on one side or the other, much of the clover growth was dug out or covered up.

Within the last few years, however, it has been noticed that the clover began appearing on the rough banks until at this time there are hundreds of acres of it. When the bloom comes, the bees get busy, and, as may be conjectured, they lay in a rich store of as fine a product as may be found in any milk-and-honey land in the world.

The accompanying pictures were made at Romeo, Illinois, and near the home of John J. Keig, a poultry-honey man. He breeds and raises Buff Plymouth

Rocks, and also owns ten colonies of bees, from the work of which he recently sold 500 pounds of honey. Other property owners in the valley keep bees that find the rich bloom on the canal banks and in the adjacent territory. Quite recently the drainage board had its attention called to the increase in the clover acreage within the sanitary district, which by this time embraces 260 square miles of territory, and no one at this time was able to say that the great corporation may not turn to producing honey within a bailiwick in which by this time it has expended $53,000,000. J. L. GRAFF.

Ravenswood, Ill., August 1, 1908.

On my return from California in the fall of 1903, I was greatly impressed with the piece of engineering as planned and carried out for that great canal. Well, there are places where the soil, stones, and gravel are piled up, to get it out of the way, in heaps that almost rival in size the *mountains of California*. At the time of my trip, railroads were constructed for the purpose of carrying this refuse material wherever it was wanted for filling in for railroading and other work. But I suppose it will be many years before these "hills and mountains" are entirely removed out of the way. The fact that sweet clover will take root and grow, and get sustenance from the air on such miscellaneous soils as those taken out at a great depth in the ground, is an additional proof of the great worth that it may have in making the most unpromising soil productive. This reminds me that the growth of sweet clover in the suburbs of Toledo is this year just wonderful. When the farming community all get to understand the way in which this plant does "missionary work" in restoring poor soils, we shall recognize what a wonderful gift to agriculture is this luxuriant sweet clover that has been so many times called by thoughtless people a "noxious weed." A. I. ROOT.

August 1, 1908.

I have fed sweet clover and sweet clover hay at various times and for various periods during the past ten years or more, and I never noticed any injurious effects from it whatever. In fact, at one time when we fed our three Jerseys for several weeks on nothing but sweet-clover hay and bran, we decided, according to my recollection, that it made a little nicer butter than anything else. At any rate, private customers gladly took it at the highest market price. The idea of adding it to other varieties of hay is doubtless good; but it should be done at the time the hay is made and stacked away. I wish some of those who are skeptical about the value of sweet-clover hay could have watched my horses several weeks ago. We had cut a small quantity of sweet clover for hay, and put it into the barn alongside of the old alfalfa hay in which the horses had been living all winter. A few days later the young man who had been doing the feeding came to me and said: "That sweet clover makes fine hay. The horses like it better than alfalfa. I have been trying to get them to use up the old hay by mixing the new hay with it, but they will hunt out every bit of the sweet clover before they will eat any of the old hay."

J. A. GREEN.

Boulder, Col., July 15, 1907.

SWEET CLOVER; THE RESULTS OF SOME EXPERIMENTS IN GROWING IT ON LOOSE AND HARD SOIL.

I noticed on p. 1048, of last year, that some one thinks sweet clover will grow on cultivated ground the same as anywhere else. Last spring I purchased 75 lbs. of white unhulled sweet-clover seed, prepared my ground (about five acres) and sowed early in spring. It came up nicely, and it seemed as if there would be a fine stand; but as the summer went by, the clover gradually disappeared; and by fall there was scarcely a stalk to be found. I think that, on account of the ground being loose, it perished; for during the time there was very little rain.

During a very wet spring and summer it might

do all right on loose ground; but in a dry time I think it would be a complete failure.

I now have several hives of bees, and I wanted the clover for my bees, and also while it was for bees it was for my ground also. As a soiler it has no equal. The roots penetrate very deeply; and as it is a biennial it dies every two years and leaves the roots to decay in the ground, making it very fertile. During the same year I sowed some on hard clay ground, where nothing else would grow, and, to my surprise, have a good stand.

I find that, as soon as it takes on poor clay soil, it soon makes it fertile, and other grass soon crowds it out, as the young plants can easily be smothered out.

As a forage-plant it is very good. My horses and cows are very fond of it in the spring. I sowed a small patch a few years ago for my bees, thinking nothing would eat it; but my cows kept it close to the ground, and not a stalk was allowed to bloom.

E. S. HUDSON.

Bedford, Ky., June 1, 1907.

SWEET CLOVER IN THE SAN LUIS VALLEY, COLORADO.

The pasture problem (for pigs) has been solved. Sweet clover, the common roadside and ditchside pest, makes a fine hog-pasture. When it is small and innocent, hogs like it. As it gets older, like some folks, its nature gets tough and bitter, and nothing likes it. Therefore, plant it for your hogs; and as soon as it is six inches high, cut it down with a mower close to the ground. It will keep more hogs to the acre than anything else; grows anywhere, in rocks, swamps, wet ground, dry ground, alkali ground, cinders, or anything, and is the greatest ground-enrichener of all the legumes.

C. A. LYMAN, in *The Breeders' Gazette.*

SWEET CLOVER FOR PIGS AND LAMBS.

[The evidences of the value of sweet clover for many purposes continue to accumulate. The latest pronouncement in its favor is by the editor of *The Farm Press* who has recently paid a visit to the celebrated San Luis Valley in Colorado where are raised the finest hogs and lambs in the United States. What he saw is calculated to cause the people who

class sweet clover as a "weed" to sit up and take notice. Please note carefully what he says.]

Alfalfa has an altitude limit which interferes with its cultivation in some places, as it does not succeed well above 6000 feet; but alfalfa has a first cousin known all over the United States by the name of sweet clover, and these high-altitude farmers have found out that sweet clover doesn't discriminate between different altitudes. One man declared that sweet clover will grow way up to the timber-line and it will make good feed too, if properly managed.

Sweet clover gets very woody when old, but these men pasture it down, and when it gets the start on the hogs they put the mowing machines on with the finger-board tilted up and cut it back to three or four inches high. This gives it a fresh start, and the pigs fatten on the young and tender growth. The San Luis Valley seems to have taken the lead in lamb feeding. Seven years ago an experiment was tried in feeding 600; the experiment was successful, and the next year about 1200 were fed. These were increased the third year to 12,000, and every year thereafter until 1905, when the number was estimated at 540,000; but this proved too many, at least the market at that time was not sufficient to absorb such a great quantity at paying prices and some of the feeders who didn't understand the business made a failure of it. The past season about 320,000 were fed and marketed with success.

The combination of alfalfa or sweet clover with peas works well with breeding hogs, because the little pigs, as soon as they are able to eat, get the kind of feed that is best for them.

SWEET CLOVER FOR PIGS—MORE ABOUT IT.

We clip the following from the *Kansas Farmer* of August 22, 1907:

I should like information on sweet clover. Will it do well if sown in September in Oklahoma? Where can I get the seed? My land will not raise alfalfa, and I desire to get a good plant for hog pasture. WM. QUEEN.
Woodward Co., Oklahoma.

Sweet clover can be sown in the same manner as alfalfa, about the last week in August or the first week in September, and the seed-bed should be prepared as you would prepare a seed-bed for alfalfa, by thoroughly disking wheat or oats ground which is comparatively free from weeds. The disking should be done as soon after harvest as possible, and the land disked or harrowed at frequent intervals, or after each rain, to conserve soil moisture and to prepare a mellow, firm seed-bed.

Many farmers who have not been successful with alfalfa have grown sweet clover for hog pasture, keeping the clover clipped off so that it does not become hard and woody,

with the exception of one crop each year, which is allowed to grow up and seed to furnish plants for the next year's crop. When grown in this manner sweet clover has proven fairly satisfactory; but it should never be grown for hog pasture where alfalfa does well. Any reliable seed-house in Kansas or Oklahoma can furnish you sweet-clover seed.

G. E. CALL.

SWEET CLOVER; LET THE BEE-KEEPERS GET BUSY AND SHOW THAT IT IS NOT A NOXIOUS WEED.

I am feeding our horse on sweet-clover hay that, with permission of section foreman, I gathered off from a railroad right-of-way week before last, after the track men had cut it down several days before. When I hauled it into the barn the horse would not eat it; but after it lay in the barn a week he took readily to it. I saved a quarter to half a ton and wish I had saved more. I have saved sweet-clover hay for years for horse. I think that if bee-keepers would take more pains to use it as it is cut down along the railroads and highways they would find it well worth saving and sweet clover soon would be more popular with the farmers. If bee-keepers would experiment more in curing and using it more farmers would be planting it. In one instance a former road-master took lots of pains to dig up and destroy a little of it along the street at the same time saying lots against it. I circulated word among his neighbors that I would give the first one ten dollars who would show me an instance where it damaged a farmer any and no one came after the money. The plant is condemned through ignorance and through thoughtlessness. Considerable good but coarse hay is left to waste that would save some one some money as a feed for horses and cows. Every bee-keeper who is a farmer can experiment.

ED HAINES.

Bedford, Ohio, Sept. 15, 1906.

MORE ABOUT SWEET CLOVER; ITS VALUE TO FARMERS, ETC.

About 20 years ago I became interested in bees through an advertisement of A. I. Root in the *Farm Journal*. I got the A B C of Bee Culture, and that

is the first I knew of sweet clover. I found at that time in an orchard on our own farm, about 80 rods from home, a nice patch, probably planted there by an old settler. I now live just across the road from that orchard, and that patch is there yet. The land is farmed all around that orchard, but not a plant of that sweet clover can I find in the field ten steps away, without any pains whatever to eradicate it except to till the land as usual.

A few years ago many of my neighbors were afraid of it, but now they know better. One of them asked me if I could sell him half a bushel of the seed last fall, as he wished to seed a little patch of bottom ground where the river had washed away the soil. Several of my neighbors have begun to sow sweet clover on low ground where the river washes badly. About two miles from here there is lots of sweet clover along the roadside. Near that place are 12 acres of bottom land that was made almost worthless by high water sweeping the soil off. An enterprising young farmer bought this land at about half price, he having noticed that the rains had washed the sweet-clover seed from along the road above, down across this field, and it had become thickly set to sweet clover. This field had lain idle for one year then; and as the high water came down again the next spring this sweet clover caught lots of the sediment, and sweet clover and all was plowed under. That land is now good for 60 to 75 bushels of corn every favorable year. That one transaction did more to gain friends for sweet clover than ever so many arguments.

About eight years ago I lived in Henry Co., Ill., and I cut and put up a small stack of first year's growth of sweet clover, and in the winter the cows seemed to relish it as well as red clover, and much better than timothy.

This spring I tried a little experiment. I had dug a well 57 feet deep. The last dirt was dumped in one pile. This was blue clay and soapstone. I then went and dug up a plant of sweet clover and transplanted on this pile. That plant grew as thrifty as

any, and blossomed, and bore an abundance of seed. Bees were seen on the blossoms for several weeks. This proves that sweet clover is one of the most wonderful nitrogen-gathering plants in existence. I should like to ask if sand vetch will grow on such soil. Some time ago I saw an account where a jar of soil was analyzed, and then a soy bean planted in it. After the bean had made its growth it was removed, and the soil was again analyzed, and the jar of soil found to contain more nitrogen than before the bean had grown in it; so the soy bean not only got all its nitrogen from the air, but even stored some from the air into the soil. The soy bean is considered a good nitrogen-gatherer, but I doubt whether it would grow well on soil taken 50 feet below the surface. Of course, sweet clover must have also potash and phosphorus, but I think my experience shows that these elements are at a considerable depth in the earth. The sweet clover would not only gather nitrogen from the air and store it in the soil, but it would, with its long roots, gather the other elements from quite a depth and bring them near the surface. Many worthless farms could be made very valuable with this sweet clover, as no high hill or poor steep side-hill is too poor for sweet clover to grow on.

The wheels, etc., that move the seed from place to place along a public highway also move the nitrogen-gathering germs there, for it grows so well along the highway even in barren clay banks.

Much has been said discouraging the planting of anything for honey alone; but when we plant sweet clover on poor soil the enriching of that soil is well worth the trouble and expense, saying nothing about honey. The value of sweet clover is just beginning to be known. It deserves much more credit than it has ever received from either the farmer or bee-keeper.

J. E. JOHNSON.

Williamsfield, Ill.

We grow a great deal of sweet clover here; and after reading what has been said in GLEANINGS I inclose a few facts concerning it in this section. They may not be worth publishing, yet they may show forth some of the good points of sweet clover, which have been doubted by so many.

After reading the articles on pages 1120 and 1121 concerning sweet clover I have come to the conclusion that those people who speak against it haven't tested far enough to learn the many redeeming qualities of sweet clover outside of a remarkable honey-plant.

As a whole this section of country grows a large quantity of sweet clover, or melilotus, as we call it. In the first place it was sown on waste places to redeem the land. As a land restorer or enricher it has no equal here. Then the cattle-men began to see and learn of its value for pasture. There is no grass or clover here that fattens cattle so fast as sweet clover does. A cattle-raiser informed me the other day that people had told him that it wasn't sweet clover, but Johnson grass, that fattened his cattle. "But," said he, "I noted that my cattle didn't gain so rapidly after the sweet clover had gone."

It makes good feed when cut at the proper time, and the stock relish it very much, leaving their other hay to seek out every spear of sweet clover, and eating even the coarse stalks.

But right here, in my best judgment, is where the good qualities of sweet clover have been overlooked. Sometimes, if not quite often, when stock have not been raised on sweet clover they have to learn to like it; but after once learning they never cease to make use of an opportunity to help themselves to the once distasteful stuff. I have known of horses that, when first brought to this section, wouldn't eat sweet clover at all; yet in a short time they had learned to like it so well that, if turned out to graze, you would see them leave all other grasses and seek out

a green plot of sweet clover, there to feed on their choice of the field.

I can not speak for other sections of our country; for no doubt soil, climate, etc., make a great difference; but here in our lime land sweet clover is fully appreciated and much valued as a feed, pasture, and land-enricher.

Sybil, Ala., Nov. 14. A. B. Brown.

SWEET CLOVER IN AUSTRALIA.

The Australian journals are having a good deal to say at present anent the subject of yellow sweet clover. This is due to the remarkable success attained by its use on King Island, which lies a little to the south of Australia, and which forms a part of Tasmania. A Mr. W. C. Macdougall, of Sydney, has succeeded in interesting the agricultural department with a view to the more extended trial of the sweet clover. He says in the *Journal of Agriculture* for West Australia that the seed was sown in raw white sand, and in five or six years this was changed to an almost dark rich loam capable of maintaining one steer to the acre from September to January—5 months. He further says the growth is similar to alfalfa, and that, when cut while it is in flower, it yields nearly two tons of excellent hay, which horses, cattle and sheep are very fond of. The ensilage made from it is also excellent, and yields from 5 to 7 tons per acre of green material. For fattening and dairying purposes he says it is excellent, and that 75 per cent of the fodder on the island is from this source, and that both the beef and butter command the highest market prices. Fed exclusively, it taints the butter slightly, but not enough to injure the sale in any way. Instead of cutting it close with a mower, as is done in Kansas and Colorado, the King Islanders *burn* it off their pastures every year, and they think this has something to do with the rapid improvement of the land.

In this way weeds are kept down, and a fresh start made each year. They harrow first and sow after, the rain and wind being sufficient to cover the

seed. Ten to twenty pounds of seeds are allowed to the acre. He says the animals acquire a taste for it, and, after being used to it, like it very much. It is claimed that millions of acres of similar land on the continent of Australia can be reclaimed in the same manner by the yellow sweet clover. What is peculiarly interesting about all this is that both the soil and climate of King Island correspond almost exactly to Florida, and, furthermore, that cattle-raising is the prominent industry as it is also in Florida.

If the experience of the Australians can be duplicated in Florida we may yet live to see the "Land of Flowers" become the leading bee State of the Union. One thing in favor of this view is that yellow sweet clover grows admirably in Bermuda—a milder climate than that of Florida. W. K. M.

Medina, O., Nov. 1, 1907.

SWEET CLOVER; WHAT IT HAS DONE FOR KING ISLAND.

We take the following (in addition to the above) from a newspaper clipping furnished us by Mr. Herbert J. Rumsey, of Boronia, New South Wales, Australia. If there are any farmers or other people left who insist that sweet clover is a noxious weed they had better read and ponder.

Many years ago, it appears, a Dutch ship was wrecked off the island coast, and some of the sailors' mattresses were washed ahore. These mattresses were stuffed with what is locally known now as melilot grass, and this grass contained a fair amount of seed, which, falling on the sandy beaches, threw up a few tufts and in the course of years gradually spread until it now covers nearly the whole of the coastal sandy areas.

Strictly speaking, it is not a grass at all. It is a yellow-flowered clover, known botanically as *Melilotus officinalis,* and a half-brother of *Melilotus alba,* commonly called Bokhara clover. Furthermore, being a leguminous plant it absorbs a certain amount of nitrogen from the atmosphere and transfers it to the soil. This remark may appear slightly superfluous to many readers, but it strikes the keynote of Mr. Macdougall's remarks on the subject. He said in effect:

The fertilizing power of this grass is simply wonderful. It has transformed King Island from an island of useless sanddunes into one of the best grazing districts of the com-

monwealth. This wonderful grass, sown on raw white beach sand, has in the course of five years changed the character of it until at the end of that time it has become a dark-brown color, in some places almost black; and its value as soil has increased 100 per cent. Every year it is improving the value of the land and gives increasing quantities of feed. Now the export trade of King Island consists of fat cattle, dairy produce, horses, etc., and by far the most extensively used grass is melilot. The King Island fat cattle always realize the best prices in the Tasmanian markets, to which the first shipments are made in August, and continue till February and March in each year, over 1300 head of fat cattle being sent away this last season. The King Island Co-operative Butter Factory turns out butter of the highest standard, a good quantity of which is exported to England, and is always among those brands that realize the highest prices. And this butter is made from cows whose principal food is melilot. Sheep and horses also do remarkably well on it. Sheep have been killed weighing up to 120 lbs., and the two-year-old horses of King Island are as big as the three-year-olds of Tasmania.

Melilot is very similar to lucerne in appearance, and grows to an average height of 3 feet. It has often grown to 8 feet high on heavy ash, in the better class of soil in the interior of the island. The average crop of hay is two tons to the acre, often running as high as three tons when Algerian oats are sown with it. Cattle, horses, and, in fact, all kinds of stock, are very fond of the hay, which has a beautiful aroma. When cut green for ensilage it yields about five tons per acre.

I do not wish to boom this as the best grass there is, because I know well enough it is not so. For instance, I certainly would not advise one to discard clover, etc., for melilot; but what I do claim is that for any one who has poor sandy country lying idle, this is the grass; for it not only gives you a large quantity of good feed, but is each year improving the quality of the soil until it is sufficiently rich to allow it to grow something better. For instance, there are paddocks of lucerne growing on King Island which would not be there now if the melilot had not improved the ground sufficiently to allow it to do well.

Another good point is the ease with which this grass is grown. The best way is to burn off the paddock. If scrub, it should be fallen about six weeks or two months before, and immediately after the fire sow the seed at the rate of about 10 to 15 lbs. per acre. The sooner after the fire the better. It likes to be sown in hot ashes. The fire germinates the seed more quickly than when unburnt. Melilot starts to spring from March to May, and keeps green right through to February, when it dies off, and is burned off again. It should be burned off every year until well established. It is an abundant seeder, and cattle and horses rapidly spread the seed in manure. It requires seeding only once, of course. The grazing capacity of melilot from September to January (five months) is a beast to the acre. It is somewhat of an acquired taste; but when cattle get used to it they become

very fond of it—especially so when made into hay. This melilot grass is indeed a wonderful plant; and if given a decent show it would make a lot of what is at present useless sand become useful grazing country; and the seed, not being expensive, might easily be given a trial. Dr. Cherry, of the Victorian Agricultural Department, speaks very highly of this grass, and it is also strongly recommended by the Tasmanian agricultural experts for green manuring.

King Island is this year earlier with grass than any of the districts I saw when traveling through Gippsland and the western districts of Victoria; also South Australia as far as Adelaide, and also New South Wales. At the end of March we had 4 inches of young grass, and at present it is about 10 inches. Drouths are unknown, and seasons fairly regular. I feel quite sure that, if given a show, a lot of raw sandy patches on the coast of New South Wales could be made far more profitable than at present.

A REVELATION IN ROAD-MAKING.

We all know how desirable it is to have good roads, and how miserably we generally fail in getting them. The colossal ignorance of the average "highwayman" is astonishing; but he seems to plod along, year after year, in the same old way.

Usually, as soon as the roads become dry and reasonably good in early summer, he commences with plow and scraper, and soon has a lot of "soft stuff" in the center, to be ground up into dust or mud as the weather may determine. Perhaps in October he will repeat the operation, with the same result, and will, perhaps, congratulate himself on work well done. Oh, yes! If there is any sweet clover growing in the fence-corners it must be carefully cut down, although the jimsons, rag-weeds, and thistles may go to seed. Perhaps he will do a good deal of swearing at the bee-men, who, he imagines, walk around nights sowing the seed for his especial benefit. Likely enough the farmers will do the swearing the rest of the year about the bad roads.

Last July, while driving in a distant township I struck a piece of road that was a pleasant surprise and a revelation to me. Evidently some bee-keeper must be road commissioner, or else he had learned something. Here, as in so many places in Illinois, the sweet clover was growing luxuriantly on both

sides of the road. By running a mower up and down the road several times during the summer it had been kept from encroaching on the driveway. Not only that, but the cut clover had been thrown into the middle of the road; and how springy and delightful it all was! There was no dust, and the pleasant perfume of sweet clover filled the air. Some cattle in an adjacent pasture were reaching through the wire fence and feeding on the clover within reach; and the bees were on hand by thousands, carrying away the nectar and filling the air with their contented hum. Soon I passed into another township; and, though the sweet clover had extended for miles further, it had all been cut and burned in the road, leaving a scene of desolation; and, oh how dusty it was!

Again I passed over this road in October. I had been wallowing through the mud, and was weary enough, when I again experienced the pleasant sensation of my sweet-clover road. Instead of mud there was that springy roadbed, without mud or dust. Upon further investigation I found the sweet clover had all been cut when about done blooming, and carefully piled in the road where the sun had soon wilted it, and the wagon-wheels had crushed and mixed it with the soil. Though this road ran through a level mucky country it was the best road there was anywhere. The millions of decaying roots in the ground on either side seemed to provide a sort of natural drainage that seemed to carry off all surplus water. It appeared that no work with plow or grader had been done on it for several years, and only the intelligent care of the clover had done the business.

Now, is it not possible that, aside from bee-keeping, as so often happens, we have been making war on our best friend? Surely the suggestions I have mentioned are worth investigating. Sweet clover has come to stay; and, whether we are bee-keepers or not, had we not better turn it to some account?

C. H. DIBBERN.

Milan, Ill., July 1, 1899.

Sweet clover cut after a large proportion of the blossoms have appeared will still make very fair hay. Back in LaSalle Co., Ill., the roadsides in many places are lined for miles with sweet clover. The law requires the road commissioners to cut this. The time they generally do this is when the sweet clover is in full bloom. Of course, I did not enjoy seeing the mower start on the roadside just when the bees were doing so nicely, but there was no use in objecting. Last season, though, I thought I would see if I could not make some use of the clover after it was cut. It had been cut after it had been in bloom for about two weeks, and the plant was quite mature. So I raked up a lot of this clover along the highway and put it into the barn. It was just then a very busy season of year for me, and I could not give much time to haying, so that several loads were left out a great deal longer than they ought to have been. It was so dry that the leaves would all drop off if any attempt was made to handle it after the dew was off in the morning. Some of it was rained on, and none of it had less than two days of hot sun, most of it several days. Yet in spite of this bad treatment my stock, both horse and cattle, liked it and throve on it. It looked more like hazel brush than hay, and the cattle would not eat all of the coarse woody stalks, though the horse would eat most of it up clean. I have seen the horse come in from a good blue-grass pasture and pitch into that sweet-clover hay like a small boy into a watermelon.

The proper way to cut sweet clover for hay, though, is to cut it before it comes into bloom, being careful not to cut it too close to the ground. In this way it will grow again, branching out freely and giving a good crop of honey after the ordinary growth is past its prime. I cut a small patch of sweet clover this way this season. It made excellent hay, and I think the second crop yielded more honey than if it had been cut.

The browsing of stock, if not carried too far, is often beneficial in the same way. If given free access

to it they will sometimes keep it eaten so close that it will have no chance to bloom, though it is not easily discouraged. I have seen the ground quite white with sweet-clover blossoms on plants not over two inches high.

Another way to get a crop of hay from sweet clover without affecting the honey crop is to cut the clover the first season, cutting it very late. I have never tried this more than once, but the experiment was very successful. A fair crop of very good hay was the result, and the clover was not damaged at all. I intended to try this on a larger scale, but my removal here upset my plans.

Some of the Utah bee-keepers that I met at the Denver convention told me that, in their part of the State, sweet clover was extensively raised for hay. I have also been told that in some of the Southern States it is raised largely as a forage plant. It might be a profitable thing to get some of these men to tell us how it is done on a commercial scale. I am convinced that there are still undeveloped possibilities in sweet clover. J. A. GREEN.

Grand Junction, Col., Nov. 26, 1899.

HEAVIER TESTIMONY STILL IN REGARD TO SWEET CLOVER AS A FORAGE PLANT.

Mr. Root.—I have been reading in GLEANINGS for and against sweet clover. Well, I have had a good deal of experience with it myself, and consider it a valuable plant as a forage for cattle and horses. If cut and allowed to wilt, cows eat it readily and thrive upon it, giving finely flavored milk and butter. Many acres of it are grown here around the shores of Utah Lake, upon land so heavily charged with mineral (alkali) that other crops will not grow at all, just for the purpose of reclaiming the land. After the clover crop, good crops of grain will grow. In addition to the value of the tops, the *roots* are also (*I* consider) more valuable, being one of the best root crops grown for cattle. Why, cows are just crazy for them. How I found this out was, I plowed up a five-acre piece of sweet-clover land in the fall of the year, seven

years ago, after the crops had been gathered and the cattle turned into the fields. Imagine my surprise on seeing them all gather upon this piece of plowed land and eat those clover roots down. The cows almost doubled their flow of milk. This lasted for weeks until the land was tramped so solid that they could not get another root out of it, and the plowing, I think, didn't do much good. In addition to these values the plant is valuable as a fiber-producing plant. A number of years ago, at one of our county fairs I saw some fine towels made of the fiber of sweet clover. They looked much like linen, and were very strong. So much for sweet clover. I have no seed to sell.

ELIAS JOHNSON.

Provo City, Utah, Feb. 17.

SWEET CLOVER IN DAKOTA.

Mr. D. Danielson, of this vicinity, is a wide-awake farmer and bee-keeper. He raises melilotus right along, and cuts it when in bloom, for hay. He considers it excellent food for horses, as well as a good bee plant, and does not deem it a noxious weed in this fertile soil. Mr. C. Jantz, of Marion, a farmer and bee-keeper, has been raising sweet clover for several years. He tells me that he tried to get a stand in his pasture, hoping the cows would leave enough so as to reseed it; but they, instead, hunted it and kept it cropped down close to the ground. He also says that the milk and butter from sweet clover have a most delicious flavor.

I saw a patch of it at Mr. Jantz's last summer that was, without stretching it an inch, ten feet high. I have tried to make it choke out unseemly patches of sunflower and rag weed, but this, I think, it can't do in this country. The great leaves of these plants cover the ground so completely that nothing else can come through. Though we have some nice fields of alfalfa hereabouts, I fear it is a little dry for this kind of clover; and I think that, when sweet clover shall become better known, it will prove an excellent plant for this region. S. J. HARMELING.

Marion, S. D., Dec. 27, 1899.

This clover is one that yields a large amount of honey. It begins to bloom in this latitude in the early part of July, usually; some seasons a little earlier, others a little later. By the time white and alsike clover and basswood are going out of bloom, sweet-clover is well out in bloom; and where abundant a continuous bloom will be had for securing surplus honey of two months or more. When a part of this clover is pastured or mown for hay, such will bloom the second time, and continue in bloom until after hard frosts. I have seen bees working on this bloom in October, when all other honey-yielding plants were killed with one exception, that being giant white-spiral mignonette, which is sometimes grown in flower-gardens.

Sweet clover stands drouth well, but gives a better yield of honey and pasture with frequent showers. The honey is light in color, but, to my taste, not of as fine a flavor as that from white or alsike clovers or basswood. In the dry regions of the West, sweet clover and alfalfa have proved valuable plants for bees and stock. The hay is largely fed to stock. Here cattle pasture on it freely, and the hay has seemed to give good satisfaction, as stock soon learn to like it.

This plant should be grown in all waste places, and thus take the place of the noxious weeds which grow there.

For hay this clover should be cut while stalks and leaves are a bright green, and before any seed-stalks appear. A large amount is grown on an acre when a good stand is secured.

The plant is not so hard to get rid of when desired as some suppose. When the land is broken up and cultivated the plant is gone, and no further trouble need be feared any more than from other clovers. Pasturing the field so no seeds mature has the same effect if kept up one or two summers. Some farmers in this State are growing large fields of this clover for feeding to stock in pasture and hay, so I am credibly informed.

In sowing the seed the ground should be made fine and rather firm, as better results are so secured than when the ground is left loose to quite a depth. It blooms the next year after sowing the seed.

Milledgeville, Ill., Aug., 1899. F. A. SNELL.

HOW TO GET RID OF IT, ETC.

Mr. E. Smith's advice to L. A. Sawyer in regard to getting rid of sweet clover is sound. It is just what they do here, and (I am sorry to say) they succeed. Sweet clover is termed a noxious weed in this locality. Street commissioners, road supervisors, and railroad-section foremen have strict instructions to cut it before it blooms. In this, however, they do not always succeed; but they do as a rule get at least the most of it cut before it can ripen its seeds.

As I saw this wholesale destruction I remonstrated vigorously, and I used A. I. Root's well-known phrase, "it will never trespass on cultivated soil, or any pasture;" but there I got my foot in it. I was shown places where it had got a rod or more into a pasture field and also in meadow.

Will cattle not eat it? Yes, they do; but not as long as they have plenty of June grass; and by the time June grass is scarce the clover is too big. If the farmers would cut it only once, then the cattle would take care of it after the June grass is gone. A year ago last August my bees were storing honey fast, and it all came from the sweet clover. We had had some rain, which had started the clover anew. One day I went to Plasterhead, about three miles distant, and along the roads I saw a sight of beauty—the fresh green of sweet clover, and only 6 or 8 inches high, loaded with bloom, and my bees were fairly swarming on it. A flock of half-starving cattle and pigs tried in vain to get their heads through the fence and get a bite of it; but as I returned, three men were at work, cutting down the "noxious weed" that the starving cattle were not allowed to get a bite of; and next day my bees began robbing. I had 62 colonies, and might have got many pounds of honey had it been left; but it is a "noxious weed," and must go.

Port Clinton, O., Feb. 7, 1899. JULIUS JOHANNSEN.

I see so many running down *Melilotus alba* that I feel like saying something in its behalf. It is the first of our forage-plants to come in the spring, and the last to be killed down in the fall. Stock eat it readily until it becomes rather woody, and even then eat the smaller shoots. We grow it for pasture, for hay, and as a honey-plant. We have no trouble whatever in getting rid of it here. Our greatest trouble is in keeping it set where stock is allowed to run on it. Melilotus being a biennial, we either have to keep stock off or resow every two years. It makes a rather thrifty growth on our thinnest soil, and even where the soil is washed, leaving the white limestone exposed, you will find our melilotus there by itself. We keep from 40 to 50 colonies of bees, and almost our entire crop of honey is from this plant. Our extracted is *almost* transparent (that is, almost water-white), and of a splendid mild flavor.

My uncle (a nurseryman), from Southern Illinois, was with us during the holidays just past. He pronounced our melilotus honey as good as the best. We usually sell all we get here at home, and have none for sale now. Hence it can not be said that we have an ax to grind because we praise it, but because we think we have a valuable forage and honey-plant in melilotus. L. H. GOULD.

Crawford, Mass., Feb. 1, 1899.

SWEET CLOVER IN COLORADO.

It is remarkable that sweet clover can be made to grow where nothing else will take root. I have seen it on the alkali lands of Colorado and California—lands where nothing could exist, except, perhaps, a kind of alkali weed that is absolutely useless to either man or beast; and yet we hear how sweet clover is regarded as a noxious weed by State legislatures and township trustees. Even in this State, mayors are ordered to cut down along municipal roadsides all weeds, including sweet clover, and yet there is nothing so good as a soil-binder for loose

lands as sweet clover. I should not be surprised if it were worth millions of dollars to railroad companies to prevent the washing away of embankments, for that is where it does best, on hard yellow clay or other soil where nothing else can grow and take root.

There are big dumps near Cleveland where refuse, cinders, and slag of every sort are thrown; but I have noticed how sweet clover seems to find its way along the edges of these dumps, and it seems to be creeping all over, making the waste land productive of at least some good. A. I. ROOT.

September, 1903.

SHEEP EATING SWEET CLOVER.

I see in last GLEANINGS that Mr. Sawyer is giving you a pretty hard going-over about sweet clover. Tell him we have had it growing in our place for 16 or 18 years, and it only just about keeps going, and we have favored it to keep it growing, in black prairie soil at that. If Mr. Sawyer will spend his $50.00 in a small flock of sheep, and let them tend his sweet clover, I do not think it will hurt his land or the sheep either. Ours eat it greedily.

H. C. SEARS.

Thornburg, Iowa, Dec. 8, 1899.

IS SWEET CLOVER A NOXIOUS WEED?

Mr. William Stolley, of Nebraska, gives a remarkably interesting talk on sweet clover—how to raise it, use it, and control its growth. Among many good points he makes, I note the following: "In Nebraska it will furnish most excellent bee-pasture up to the time when frost kills all vegetation, and sweet clover is the very last to succumb. For early spring pasturing of cattle, particularly milch cows, there is nothing better than sweet clover." "It runs out all noxious weeds, perfumes the air, and feeds the bees." "A public road, well and evenly seeded with melilot but the growth of it properly checked at the proper time, is a thing of great beauty, and there is nothing bad about it, but, instead, it furnishes a bee-ranch hard to beat."

YELLOW SWEET CLOVER.

I have demonstrated that yellow sweet clover is not an annual, as some writers have claimed, but a biennial, the same as the white variety. I have now a small plot of the yellow in my garden, which is two feet in height, and will soon be in bloom. It blooms from two to three weeks earlier than the white, which is a desirable feature. It grows a finer stalk, but not so tall as the white. My plot of the yellow was all destroyed, except one root, in Feb., 1899, by the hard freeze; but whether it is less hardy than the white I can not say at present. I can say this, however, that it would be a difficult thing in this locality to make the average farmer believe that the white variety ever winter-kills.

M. M. BALDRIDGE.

St. Charles, Ill., May 23, 1900.

SWEET CLOVER IN TEXAS; IS IT A "BAD WEED" ON THE FARM?

I had about 30 acres on my farm in sweet clover in 1898, and it paid me over $3.00 per acre, which is a good rent for average land here. I have about 28 acres this year, and I would continue it on my farm if it were not for my neighbors' bees, which get as much honey as I do, or more. About the last days of May, 1898, the bees were without stores, very little brood, and quite weak; yet the crop of honey taken that year paid me over $100, besides keeping it on the table all the time for six or eight in family, and the principal part of the crop was from sweet clover. It makes good pasture in early spring, and, if turned under after blooming, it will tell on a wheat crop.

Last summer, while breaking the clover land, I fastened a piece of domestic cloth on and above my disk plow, and caught quite a lot of the flying seed while plowing. I have been sowing the seed all around the fences on the farm. I prefer raising honey instead of weeds and bushes. J. H. RODERICK.

Dodd City, Tex., Feb. 28, 1900.

AN ARGUMENT FOR THOSE WHO INSIST THAT IT IS A BAD WEED.

When I began keeping bees, 15 or 16 years ago, there was an abundance of sweet clover growing along the railroad near where I lived; and although I knew very little about bees I took from 75 to 150 lbs. of honey per colony. A law was passed compelling the railroads to cut all bushes, weeds, etc., along their tracks, and they soon destroyed the sweet clover. Then my honey-yields shrunk to from 25 to 50 lbs. per colony, notwithstanding my increased knowledge of the business. Since coming here (three years this coming spring) I have sown 140 lbs. of sweet clover, and have very little to show for it. I have about 20 acres on my farm that will raise fair crops of rye, corn, buckwheat, etc., and I am willing to pay $100 to have it well seeded to sweet clover. Here is a chance for Mr. Lewis A. Sawyer, or some other sweet-clover kicker. H. J. NORTHRUP.

Jonesville, N. Y., Jan. 5, 1899.

ITS VALUE FOR BRINGING UP POOR GROUND AND UNPRODUCTIVE CLAY.

Right adjoining our premises is a bank of earth thrown out of a railroad cut. This soil came out of the cut from a depth of ten or twelve feet. Some years ago I got permission of the railway company to use it by way of experiment. Of course, nothing would grow on it—that is, nothing but sweet clover, which is already along the railroad. We let it grow up and scatter seed until last spring, when I saw there was a dense growth of thick, succulent stalks, about two feet high. When we were plowing under the clover in the field adjoining, I directed our folks to turn under the sweet clover, and said we would try it with Carman potatoes. The potatoes came up rank and strong, to my great surprise, and we have just been digging them, and I was surprised again to find some of the handsomest, cleanest potatoes on that hard, unproductive clay bank that I ever raised anywhere. There was not a particle

of scab, no work of wire worms or grubs; and the crop that we got was at the rate of at least 100 bushels per acre. From this experiment I infer that sweet clover is not only worth as much to turn under as any of the common clovers, but I should say even more.—GLEANINGS, Nov. 1, 1900.

AN ESTIMATE OF ITS VALUE PER ACRE AS A HONEY-PLANT.

Bees have done very poorly for me this season on account of cold wet weather in June, losing a few hives by actual starvation before I was really aware of it; and if it had not been for a three-acre field of white sweet clover I should have lost more as this patch kept about fifty hives in fair condition. In fact, they went far ahead of the out-apiaries. I have sown this season five acres more, and next spring I intend to put out about forty acres more, as I can rent land for this purpose at $1.50 per acre. I intend to put out mostly the yellow variety, as it comes in just at a time when there is nothing else, and the blooming-period is longer; but the three acres of white, I am satisfied, was worth to me this season $30.00, and I also have considerable seed from it. R. L. SNODGRASS.

Gordon, Kan., Oct. 2, 1903.

SWEET CLOVER AT THE OHIO EXPERIMENT STATION.

Below is the decision of the Ohio Experiment Station, sent out in the form of a newspaper bulletin in 1898:

Many portions of Ohio have the roadsides and other sodden or "out of tilth" lands occupied by the white sweet-clover plant (*Melilotus alba, L.*). Since it has been regarded as a noxious weed the former Ohio Statute placed it in the same list of proscribed plants with Canada thistle, common thistle, oxeye daisy, wild parsnip, wild carrot, teasel, burdock, and cockle-burs.

Under the operation of this statute, private lands might be entered upon to destroy the melilotus growing for any purpose, as for bee-pastures. The destruction of bee-pastures in this manner actually occurred near Delaware.

Rightly, then, it may be asked, "How shall we rank sweet clover?" To answer this we must consider where sweet clover grows and what is its character. Sweet clover grows spontaneously along tramped roadsides, even to the wheel-ruts in abandoned roadways, and in tramped or sodden land

anywhere. When found in meadow lands it appears not to occur except when the ground has been tramped by stock when wet. It grows by preference in old brick-yards. It may be grown in fields by proper tillage.

The character of sweet clover may be now determined. Viewing it in no other light we thus see that sweet clover grows luxuriantly in places where few or no other plants flourish. But it belongs to the great class of leguminous plants, which are capable, by the aid of other organisms, of fixing atmospheric nitrogen and storing it in the plant-tissues. It belongs with the clovers, and it may thus be used to improve the land upon which it grows, and this appears to be its mission. It occupies lands that have become unfitted for good growth of other forage-plants. Its ranks, then, is as a useful plant, capable of increasing fertility of land.

How shall sweet clover be treated?

The character determined, the treatment to be accorded this clover-plant is really settled. The plant is the farmer's friend, to be utilized and not to be outlawed. The plant grows and spreads rapidly. So do red clover, white clover, timothy, blue grass, and other forage-plants; but sweet clover grows where they do not; it indicates lack of condition for the others. Viewed in this way it is to be treated as preparing unfitted lands for other crops.

It may be mown a short time before coming into bloom, and cured for hay. Stock will thrive upon it if confined to it until accustomed to it. The roadsides, if taken when free from dust, may be made almost as profitable as any other area in clover by cutting the sweet clover and curing for hay. If this is regularly attended to while stock is kept from other lands that it invades, sweet clover will be found doing always the good work for which it is adapted.

ITS HABIT OF GROWING ON POOR SOILS.

Several years ago the B. & O. R. R. opened a gravel-pit at Belpre, O., for ballasting the track and constructing fills. Sweet clover first made its appearance in this region, so far as my observation goes, on the fill forming the approach to the Parkersburg bridge. This fill was made of gravel taken from the Belpre gravel-pit.

Last week as I passed by this pit, now thirty feet deep, I noticed sweet clover growing as thick as it could stand in the bottom. This gravel deposit is of combined glacial and alluvial origin with an occasional true boulder, brought down by the river from the glaciated part of the State. Was the seed deposited with the gravel? Dana, in his geology, speaks of plants growing from sand taken from the bottom of a well dug a few miles from the seacoast. There were no plants of the variety growing near the well, but they were found growing on the seashore. No doubt the well had tapped soil which at one time had formed the sea-beach.

[The above was sent us May 1, 1902, in the shape of a newspaper clipping, so we can not tell what

paper it was taken from. It emphasizes the fact made by Professor Thorne, of our experiment station, that sweet clover, as a rule, occupies ground where no other plant would grow; but after the sweet clover has got a start, and has been plowed under, various farm crops may be grown successfully.—ED.]

SWEET CLOVER CONTRASTED WITH ALFALFA.

The following paragraph by Mr. W. A. Varian, of Dublin, in regard to sweet clover, seems so pertinent and well written that I copy it just as it is.

Sweet clover, or Bokhara clover, as it is variously named in the United States, is a biennial. When grown from seed in the spring, it makes a fine growth for hay, or green feed for cattle in the late summer; but it does not flower in its first season after sowing. The second-year growth starts earlier than alfalfa (lucerne), so there is a good "bite" for stock before the latter shows. In fields where both are growing, these young plants look very much alike. The melilotus, however, will endure as much drouth as alfalfa, while it will do well on a much wetter soil than the latter. It cares nothing for the hard winters of the Western United States. I believe it was introduced into the States from Tartary as a dry-weather forage-plant for stock, but was not taken kindly to by the ranchmen, and has since spread as a weed all over the West, from Michigan to Colorado, during the past twenty-eight years. This result comes about because it sprouts in spite of the small attempts of the careless, slovenly farmer, and grows wild along the sides of roads, railways, and irrigation ditches. It also spreads over neglected corners and commons, apparently not caring how hard or poor the soil is, where the climate suits, for I have seen it growing as high as 5 feet when in flower. The plant bears a great number of insignificant-looking bunches of little white flowers which give out a strong smell of honey, quite perceptible some distance away.—GLEANINGS, JAN. 1, 1901.

HULLED SWEET-CLOVER SEED SETS AS QUICKLY AS ALFALFA, ALSIKE, ETC.; THE HULLED REQUIRES SIX MONTHS.

The articles in GLEANINGS on the subject of sweet clover are very interesting. I bought a few pounds of The A. I. Root Co. in the fall of 1909. The yellow was hulled, the white was unhulled. I sowed both varieties in September. The yellow hulled seed

came up in ten days, but the white showed no life. On page 828, June 15, 1907, J. A. Green says the white hulled seed came up very promptly, while the yellow unhulled came up best the following spring. I think our combined experience shows that hulled sweet clover seed of either variety will germinate just as quickly as alfalfa, alsike, or any of the clover family, while the unhulled seed requires six months, or time to rot the hull before it comes up, thereby removing the bar that has been following sweet clover —that is, that it invariably takes six months to germinate.

As clover honey granulates quite readily the apiarist is fortunate if he lives where gallberry (holly), mountain sage, or snowdrop grows. The snowdrop grows on the open hills or in dense forest growth in my locality. It is a fine-growing shrub, never over four feet high, with a small pink bell-shaped flower that produces an abundance of water-white honey in June. The seed is produced in white berries that hang on all winter. I have a bottle of this honey mixed with clover three years old that has frozen repeatedly, and has just commenced to granulate. F. F. GEORGE.

Fraser, Idaho, Feb. 16, 1910.

Sweet-clover Notes from Dr. C. C. Miller, Marengo, Ill.

Last summer our cow-pasture was, perhaps, one-fourth covered with sweet clover. It grew rank, but the cow didn't seem to care for it. Still, there was so much of it that it would hardly be noticed if she ate quite a bit. But the grass was also luxuriant and abundant, and she evidently preferred that. By and by there came a dry time, a very dry time, and pastures were brown. Then it was that the sweet clover showed its value. It remained cheerfully green while the grass about it was dry and parched. It had, however, run up to six feet and more in height;

Fig. 1—A pasture of sweet clover near the home of Dr. C. C. Miller, Marengo, Illinois.

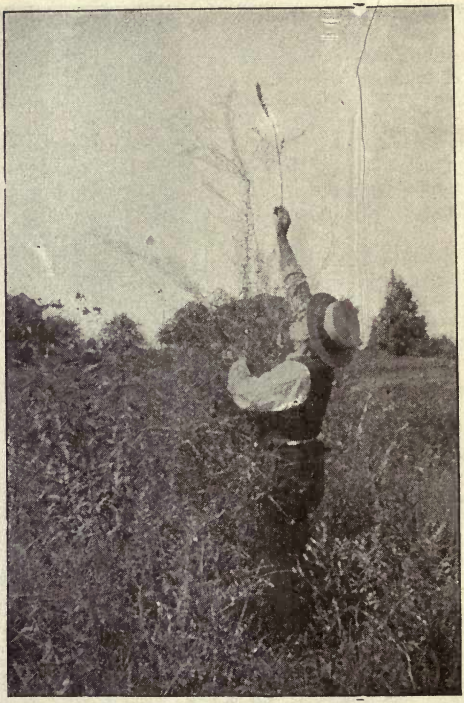


Fig. 2—Luxuriant growth of sweet clover at Dr. Miller's.

and if you stop and look meditatively at a solid mass of sweet clover six feet high you'll realize that there's a lot of feed in it. Gradually it was reduced in height (although, of course, the cow didn't eat from the top down) until finally it was reduced to a height of two feet or so, as you will see by Fig. 1 from a photo taken Sept. 3, 1906. Compare this with

The Purity of the
SWEET-CLOVER SEED

Sold by The A. I. Root Co. is Attested to by the U. S. Government

READ THIS LETTER:

Brooksville, Ky., March 13, 1911.

The A. I. Root Co., Medina, Ohio.

Gentlemen:—Some time ago I sent to you for a sample of your white and yellow sweet-clover seed. After receiving the samples I sent them to Washington, D. C. The yellow hulled tested 99.71 per cent of pure seed; the unhulled white tested 99.11 per cent of pure seed. I think that is fine. I inclose you the sample that you sent me, and want you to send me 80 lbs. of the same lot that this sample is out of, or some equally good. Send the seed by freight.

Yours truly, H. A. JETT.

We have a booklet, published for free distribution, which tells THE TRUTH ABOUT SWEET CLOVER. Ask for your copy.

PRICES

	In lots of— 1 lb.	10 lb.	25 lb.	100 lb.
Hulled Yellow Annual (*Melilotus Indica*), lb.	17c	15c	14c	13c
Hulled Yellow Biennial (*Melilotus officinalis*).	20c	18c	17c	16c
Hulled White	25c	22c	21c	20c
Unhulled White (*Melilotus alba*) per lb.....	17c	15c	14c	13c

The prices are all subject to market changes.

As to the comparative value of the different varieties, we will say that the white, or *Melilotus alba*, is most common, and therefore the best known. The yellow is desirable because it begins blooming usually from two to four weeks earlier than the white. As to the two varieties of yellow, one of the experiment stations has said there was a distinction without a difference.

The A. I. Root Company, Medina, O.

would go through till clover harvest without any feeding. But at the opening of the harvest there would be a good deal of empty space in the brood-

Fig. 2—L

and if yo
mass of sv
there's a l
in height
from the top down) until finally it was reduced to a height of two feet or so, as you will see by Fig. 1 from a photo taken Sept. 3, 1906. Compare this with

the height of the single stalk in Fig. 2, which was taken the same day. But the comparison is not entirely fair, for No. 2 grew on rich low ground that had the wash from the elevated ground surrounding, and this stalk growing alone was especially selected on account of its unusual height. I was afraid the slender top might not show in the picture, so I held a dried weed beside it at the same height. From the ground to the top was just nine feet. I may have seen taller sweet clover, but I'm sure that's the tallest I ever measured.

That the cow does not eat it down lower than shown is a good thing, for each plant is bushy, throwing out fresh growth on all sides as fast as eaten off, thus furnishing a constant supply of tender growth until freezing weather. It also makes it of greater value for the bees, for the fresh growth is always blossom growth, and if you had been present at the time the picture was taken it would have reminded you of bees working on buckwheat.

Some one will say: "But I thought you told us the honey crop of 1906 was an entire failure with you; and if the bees were so busy on sweet clover why the failure?" My dear sir, a pasture-field for a single cow is not a very large field of operation for a yard full of bees. To be sure, that was not the only sweet clover within reach, but the road commissioners took care that not much of it should be allowed to blossom on the highways. Yet some credit should be given to sweet clover and cucumbers, for, besides having the hives heavy with honey for winter, I had some combs filled that I have stored away for next spring. Just wait till I go down cellar, and I'll tell you how many there are. . . . There are 248, most of them full, and from that down to half full.

I count those combs much the same as so much white-clover honey in sections. I'll tell you how. The hives are, I think, heavy enough so that the bees would go through till clover harvest without any feeding. But at the opening of the harvest there would be a good deal of empty space in the brood-

chamber, and that space would have to be filled before the bees would devote much attention to the supers. Now, if I take away combs that are empty, or nearly so, replacing them with these reserve combs, don't you see that every pound of such honey thus given means another pound of white-clover honey in the sections? Besides, it's a "dreadful' comfortable feeling to know that you are fully provided against any contingency if any colony in spring should be short of stores.

I have always thought I didn't care for yellow sweet clover, because it comes two to four weeks in advance of the white, right when white clover is doing its best. But last season made me change my mind; for white clover didn't do its best, although blooming abundantly; and if the yellow is an unfailing yielder the same as white sweet clover (and I suppose it is), then the yellow would come in very handy.

In the eyes of the general public, sweet clover is a very noxious weed whose first encroachment must be carefully watched, lest it get a foothold and spread persistently and promiscuously. The great objection in the eyes of the bee-keeper is that it is so hard to get a stand of it. I have tried several times to get a solid field of it, but have not yet succeeded. This cow-pasture comes the nearest to a success of anything I've had, and I did not try to get a stand there.

I'd like to have a solid field of it so I could have some hay that was nothing but sweet clover. My stock care more for it dried than green, and I suppose that is the general experience. The horses care more for it than the cow, but other cows may care more for it than ours.

SWEET CLOVER IN GERMANY.

Friend A. I., I send you a picture out of *Centralblatt* to show you how sweet clover grows in the German language. It was windy when the picture was taken, so the plants don't show as well as they might; but Herr Reepen says the average height of the stalks

back of the man and boy is 9 feet 10 inches, and the one stalk that Herr Wegener is holding in his hand is 10 feet 8 inches high.

But what I wanted you more particularly to notice is the growth of the potatoes this side of the man and boy. Those in the foreground, as you see, have made a poor growth, while the three rows next the sweet clover have grown most luxuriantly. And yet they were planted with the same seed and at the same time. Herr Reepen thinks the difference must come from the nitrogen gathered by the sweet clover It seems as if there must have been some other difference, perhaps accidental, but still it may be worth while to make some experiment to see whether anything like the same difference might be made in this country. I commend the case to your consideration.

C. C. MILLER.

Marengo, Ill., April 15, 1899.

[I should be exceedingly glad to submit to our readers the picture sent us. It looks to me as though the ranker and stronger growth of the potatoes close up to the sweet clover may be accounted for partly by the shade. If the soil was sandy or gravelly, the sun was likely too hot for them in the open field; and this great mass of sweet clover would not only shade the potatoes, but if there were an abundance of rain it might also help to keep them damp longer than those standing out in the full blaze of the sun. I wish our German people would tell us through Dr. Miller, or in some other way, how much sweet clover is worth for feeding stock in the "Fatherland."]

Farmers' Bulletin No. 18 says of sweet clover: "As a restorative crop for yellow loam and white lime lands this plant has no superior; and for black prairie soils it has no equal." [In some parts of the great West there are what are called "alkali lands." Irrigation for a series of years has forced the alkali out of the soil to the surface, with the result that ... kills everything except pear trees, salt weeds and sweet clover. I know a spot in Western Colorado —perhaps the finest location in the world—where

there are hundreds and perhaps thousands of acres of alkali land covered with nothing but sweet clover, for nothing else will grow. A bee-keeper whom I know located in that vicinity struck a bonanza, for no ranchman or farmer will invade his territory—at least not till all the other available land is taken up. The time may come, when land is scarce, when the ranchman will be called on to use the alkali land and grow sweet clover for a hay crop. Then, perhaps, the world will wake up and discover that it is not an enemy but a friend.—ED.]

DR. C. C. MILLER in GLEANINGS.

Clippings from *The Rural New-Yorker.*

There has been a great development in public opinion regarding the value of sweet clover. Up to this season most farmers who ever saw it growing have regarded it as a weed. Many have seen it growing along the line of railroads and classed it with burdock or ragweed. It now appears that sweet clover is one of the hardiest of the legumes, that it will grow in poor soils where other clovers die, and that it is one of the best crops to introduce alfalfa. The sweet clover is winning its way to a fair place among the plants to be tested.—*March* 19, 1909.

Sweet clover is a wayside weed. Most people think it a pest. We are beginning to see that it has noble qualities. An orphan asylum in an Ohio city refuses to tell people adopting children from it anything about the parentage of the orphans. Whether sprung from wayside weeds or from the budded plants of hereditary culture, no one about the child knows. The results seem to show that most of our common human weeds are precious plants so long as no one can call them weeds and prove it. To have wasted the melilotus for so long is a blunder, perhaps; but how much greater the tragedy when we recklessly

tag a human being as bad and thus make him so. And are we not doing this all the time?

Perhaps in the last analysis there are no really noxious plants—nor bad people.

SWEET CLOVER IN ILLINOIS.

Last year, in an article headed "Sweet Clover," I. A. Thayer suggests that land might be inoculated for alfalfa by the previous production of a crop of sweet clover, because of the fact that the sweet clover bacteria appear to be identical with the alfalfa bacteria. I beg to call attention to the fact that land which needs to be inoculated for alfalfa also needs to be inoculated for sweet clover. On the ordinary prairie soil in Illinois we have more than doubled the yield of sweet clover by proper inoculation, and the inoculated crop is also very much richer in nitrogen than that grown without inoculation. It should be remembered that the natural means by which sweet clover becomes disseminated will commonly provide for the dissemination of infected soil as well as for the dissemination of the seed. Thus, if sweet clover is growing along the roadside and some seeds are picked up by a wagon wheel and dropped off a mile or two farther on, the infected soil is likely to be carried with the seed. If the seed is carried by running water from one place to another, of course, the bacteria are likely to be carried with it.

University of Illinois. CYRIL G. HOPKINS.

SWEET CLOVER, MELILOTUS ALBA.

This plant has interested me for several years. In this vicinity are large patches of it, and I have been studying it in its growth, its nitrogen content, and its bacteria. In places along railroad fills of slag cinder, banks of gravel, dumping-grounds around lime-stone quarries, and in excavations where it would be thought there could be no fertility, and in almost any place where seed had lodged, except on sour clay, I have seen it growing as thriftily as any other plant on the most favorable soil; and in many of these places the ground was so poor that not another green

thing appeared. In most of these places the growth was very heavy, much of it six feet tall. I would guess that in such places it would yield three or four tons per acre of the dried plant. In nitrogen content I find that it stands with alfalfa and the vetches. I discover that it not only furnishes a rich field for bees, but that horses are fond of its leaves and branches. I have wondered why we could not make a green-manure crop of it. Doubtless we would be compelled to plow it in long before it reached its full growth. It seems to me that there are great possibilities in it.

In the summer of 1905 I made this test: Taking the hint from Prof. Hopkins, after sowing my fourth field of alfalfa I sowed a strip a rod wide across the center of the field with soil taken from a sweet-clover patch, at the rate of 400 or 500 pounds per acre. This strip was a fair sample of the rest of the field, which was not inoculated. Last summer I cut more than twice the hay from this strip that came from a similar area on either side of it, and far more nodules were found on the roots. It looks very much as though its bacteria were identical with those of alfalfa, as Prof. Hopkins claims. If that be a fact, then a good preparation for an alfalfa crop would be the production of a sweet-clover crop, plowing it in during the fall and sowing alfalfa the next spring. If any have experimented with this plant there are a whole lot of us who would like to hear from them. And if you have not, why don't you? I. A. THAYER.

Pennsylvania, April 20, 1907.

SWEET-CLOVER NOTE.

On page 338 there is inquiry about sweet clover. It is considered a weed here, taking possession of the roads, but it is very little trouble in cultivated fields, as it is nearly as easy to exterminate by cultivation as red clover, unless you have some low-lying land where the seed is washed on from higher ground not cultivated. It is a very prolific seeder, more so than any other clover I know of, and I should not wonder if, under favorable conditions, it would yield

20 bushels of seed to the acre. Last year I made some hay from a low-lying piece of ground of less than an acre in sweet clover. I had sown the strip in timothy the year before; but as the seed of the clover was washed on it from higher ground, the clover choked the timothy, and so I went and cut it for hay. It made about three loads, but it is very difficult to cure, as the stems persist in staying sappy for days after the leaves crumble off when you touch it. It has to be made young or it will be so hard that horses cannot eat it, let alone cows. I fed it to horses, and they seemed to relish it; cows also like it green in pasture as long as it is young, say not more than a foot high; but they have to become used to it, as some cows will not touch it at first. Most cows like it as hay at first trial. C. L. R.

Illinois, May 18, 1907.

SWEET CLOVER IN THE SOUTH.

In your issue of April 25 a Pennsylvania correspondent has a good word in behalf of melilotus. This plant in the North and West is usually regarded as a weed. In the South the white-flowered variety is regarded with much favor as a forage plant, and also for grazing. It is largely grown in certain sections of this State and Alabama, in the limestone regions, and when the plant is mowed at the proper stage, before there is too much wood developed in it, the quality of the hay is considered second to none of the clover family, alfalfa not excepted. It thrives to advantage only on lands strongly impregnated with lime. Here it is at its best, and reaches its greatest perfection. It will take root and grow luxuriantly on bare lime spots where there is no other soil on the surface of the ground. In time, left to itself, it will completely hide these unsightly bald places, and corn and other field crops can be grown profitably on the land. It has an enormous tap root that penetrates deep down into the subsoil and gains nourishment from plant food denied to other leguminous plants. It reseeds itself every two years; but if the plant is mowed (in this climate at

any rate) or grazed, so that no seed can develop, the plant seems to lose its natural tendency to give up life after two years' growth, and will continue to produce good crops for several years in succession. It has been fully ten years since I have sown any melilotus seed, and yet I find it every year more or less plentiful and luxuriant on my Johnson grass and Bermuda grass meadows. Of course the presence of this plant on the lands named is highly beneficial to these meadows, the coarse, deeply penetrating tap roots of the melilotus opening up the compact soil and thus conducing to the better growth of both Johnson and Bermuda grasses. Hay made from melilotus when the plant is in just the right stage of growth for best results, and properly cured, is a hay that is in every sense equal to the best quality cowpea vine or any of the clover family.

Mississippi, June 15, 1907. EDWIN MONTGOMERY.

SWEET CLOVER FOR MULCH.

In regard to growing mulch crops for strawberries, I have never found anything better than the sweet clover growing along the roadsides and on railroad embankments. Wherever it has been growing for a year or two it has all other weeds choked out, thereby preventing the bringing in of other weed seeds. I cut it when first in blossom. It stands then about four to six feet high. After letting it lie for a week to dry out I haul it in while wet with dew, to save the leaves, and stack it up ready for spreading over the strawberry beds in the fall (about one-quarter acre). Of course larger growers may not find it plentiful enough to supply their needs, but why not raise it? It seems to thrive almost anywhere, even in the cinders and stones of railroad embankments. I believe I could raise a larger bulk of it on a given piece of land than any other crop for mulch, corn not excepted. Furthermore, it lies not so flat or heavy on the berries as cornstalks, catches more snow on account of its spreading branches, and is heavy enough not to blow away.

Aug. 24, 1907. G. H.

In reply to your request for experience in inoculating alfalfa with sweet clover, page 652, I will say that, while my experience is rather limited, still I have experimented with them for several years. A number of years ago I secured a trial package of sweet clover and sowed it in the spring on a rather thin clay soil. It grew very well, but I found that it did not develop tubercles on the roots. After the second year the ground was reseeded from seed falling upon the ground. This crop developed tubercles on the roots, and grew six to seven feet high. The seed got scattered near our yard and grew from year to year. Soil taken from about the roots of the sweet clover was scattered over a plot of alfalfa which had failed to develop tubercles, and was looking rather sickly. In a few weeks the alfalfa changed to a dark green and grew rapidly. Upon examination I found that, where the soil from the sweet clover had been put, the tubercles were thick on the alfalfa roots, but on a part where there was no soil scattered from the sweet clover the alfalfa looked yellow, and no tubercles were found. I then inoculated the remainder of the plot, and could notice an improvement in the growth of alfalfa in about two weeks. A. J. Legg.

West Virginia, Sept. 28, 1907.

SWEET CLOVER AS STOCK FOOD.

The following is suggested by reading Mr. Legg's article above, "Sweet Clover and Alfalfa." There are wrong impressions regarding the plant. Here it grows very rank on the roadsides, and in some fields. I used to think, like Mr. Legg, that stock would not eat it, for I often took care to notice when driving along a road on the sides of which it grew as high as a horse's back, whether the droves of stock, cattle principally, fed on it, and never did I see that a plant had been nipped. Later, in a field where a lot of large steers were pasturing, the sweet clover grew in great abundance, and the cattle, by feeding on it, had cut it down to about knee-high. It had made a large

growth before they began to feed on it, and below the height mentioned it was too coarse and hard to be palatable. Seldom now do we see it in pasture fields; but on the roadsides adjoining these fields it grows in abundance, and would undoubtedly grow in the fields if the stock let it alone. When driving lambs along the highway I have noticed that they eat it as readily as the grasses that grow with it, blue grass, etc. Men owning horses in my nearest village I have known to cut it from the roadsides and haul it to their stables and feed it to their horses. At first they refused it, but soon learned to relish it. I know of a timothy meadow being cut this year that had growing with it an equal bulk of sweet clover. This was stored in sheds, and will be fed out to cattle this winter. In the same field in which this timothy grew last year, after wheat, there came on five or six acres a very rank growth of sweet clover. This year there grew a very excellent crop of corn on the same land. Alfalfa grows on all the land about here without soil inoculation. But unless the land is well drained, naturally or artificially, it will winter-kill. As regards sweet clover, I would gladly have more of it grow on my farm than the stock and cultivation will allow to grow.

Ross Co., Ohio, Oct., 1907. JOHN M. JAMISON.

SWEET CLOVER AS PASTURAGE.

Though quite a lot of sweet clover grows here, at present it is mostly along the roadsides, so that we do not get much value out of it for pasture. However, it is well known by the farmers here that when stock are occasionally pastured on the roads they greedily eat the sweet clover, even when quite large. I do not think it will pay to make a pasture exclusively of this clover, for it requires conditions quite similar to those under which alfalfa will thrive. It is a biennial, dies, root and all, after ripening seed, and, though the seed will live in or on the soil for years, and grow under suitable conditions yet, because if its biennial character, pasturing would certainly

kill it out in two or three seasons. Perhaps the roots would live in the soil and grow continuously if kept pastured down so as not to go to seed, but not so closely that the plants would be killed out. Some recent observations of some patches here seem to confirm this view of the matter; and if such be the case this plant will pay well as a pasture plant where alfalfa is not a profitable crop. Like alfalfa, sweet clover needs drainage and lime, and soils rich in phosphates and potash. In food value it compares well with alfalfa, according to the few analyses that have been made. The bacteria that inhabit the root nodules of sweet clover and alfalfa are identical, or at least are capable of living on either kind of plant, and for this reason sweet clover is a good plant to precede alfalfa, to insure the proper inoculation of the soil. We wish that more of this clover were in our fields, pasture fields especially, and anywhere else where it will do us more good than on the roadsides. The seed may be sown in August or February, and may get start enough to be pastured or cut for hay the following summer. There is getting to be a better understanding of sweet clover. It is no longer regarded by farmers as a pestiferous weed, to be fought and exterminated at any cost, but is regarded now as a friend, and the danger is that we may expect too much from it. I am informed that it is used for both hay and pasture in some of the Southern States, and if any of our readers there have had experience with it as a field crop will they tell us what they think of this clover? W. E. DUCKWALL.

Highland Co., O., May 22, 1909.

SWEET-CLOVER NOTES.

There has been some little discussion lately about the value of sweet clover for stock food, or for improving the soil. It was reported that the seed could not be obtained, but several of the seedsmen offer it —mostly thus far for bee pasture.

SWEET-CLOVER SOIL AND ALFALFA.

And as sweet clover is everywhere growing along the roadsides there is no reason why men there should not

inoculate when first they sow the seed. It is a simply done thing—just a quantity of soil, say 100 lbs., mixed carefully with 20 pounds of seed, sown together and instantly harrowed in will give the desired inoculation. Early August or July seems a good time to sow alfalfa here, though some sow in spring with success. A man could get this inoculated earth in wagonloads and put it on with a manure-spreader, if he chose, and all the better, so he harrowed it in promptly. We were interested in studying sweet clover, as it grew along the roadsides and in waste places. Every man's hand is against it (save the bee-keepers), yet it is evident that, even here cattle graze it, for we saw none in the pastures. It had been grazed down close there. Not that it is worth while sowing it in Iowa, but there are many regions where it can be grown with profit, I am sure. We will sow it in Louisiana, for instance.

This clipping is from a recent Breeders' Gazette, and is part of an article by Joe Wing. Mr. Wing recently told me that much sweet clover was growing in the Gulf States, and that some preferred it to alfalfa. He is intending to sow it on the Louisiana plantation in a mule pasture, but intends to sow burr clover with it. For hay, he says it must be sown thickly and cut earlier than alfalfa.

W. E. DUCKWALL.

WHERE SWEET CLOVER COMES FROM.

Some years ago the earth from the excavation of Jerome Park Reservoir, New York city, was used to fill in salt meadows near Pelham Park. The material was practically all subsoil, rocks, gravel, and clay. For the past three years or longer this has been covered with an almost unbroken growth of sweet clover, 50 acres of it or more. The average height is six feet, though many stalks are 8 and 8½ feet high. The growth is so dense tnat it is difficult to force one's way through. The roots of the plants of this year's growth are abundantly noduled; the old seeding plants have very few nodules. The old roots are 1½ to 2 feet long, and there is already a good deal of humus from the dead plants and roots. In places grass is coming in, and there are hundreds of very thrifty locust trees scattered about. How came the clover there? It extends also along and beside the embankment of the now disused railroad on which the filling was conveyed from the reservoir. I have taken some of the soil and seed and sown it on a rundown field on my farm in the hope that what it has done for the filled meadows it may do for my field. The Department of Agriculture recommends sowing the seed in early spring; but in the case of these meadows the seed is evidently self-sown from now on. A horse to which I offered some of the young plants ate them with avidity. The taste to me is not unlike that of

red clover. Do not these facts indicate great possibilities for sweet clover? W. C. D.

Sweet clover usually works into a new territory along the railroads. The seed falls out of a passing car, or comes in baled hay fed to horses. We know of one case in Bergen County, N. J., where this clover started in a railroad cut where freight cars stand. We shall be interested to know how this experiment of scattering the soil turns out.

Oct. 2, 1909.

Sweet clover will probably grow on soils that are slightly acid, but it much prefers limestone soil. It will grow on soil that is practically exhausted and worthless, and will thrive there, producing considerable humus from its decaying roots and tops, and also adding much nitrogen to the soil through its bacteria. The writer has corresponded with many men who have sown down fields that they considered practically worthless, leaving the sweet clover to grow up, fall, and decay, for three or four years' time, then plowing and cultivating for more useful crops, and, without exception, they state that one would never recognize it as the same soil that they at first seeded down to this plant. Sweet clover is a biennial; that is, it lives for just two years. A field sown to it will come into bloom the second year, and if not harvested will reseed itself on the same ground, thus continuing indefinitely to grow, to deposit its roots and tops in the soil as a fertilizer, as well as to build up the soil by its bacteria. Some writers prefer seeding the field two years in succession, thereby obtaining somewhat quicker results, because there will be plants in bloom each year, whereas if sown but once for the most part there will be plants in bloom only every other year.

Sweet-clover seed is said to heat very easily, and most commercial samples appear to be worthless. Every one of our correspondents recommends caution in buying the seed. Probably if it were grown more, the growers would learn better how to handle it, and a better article would be put upon the market. It is also quite slow about germinating, many writers

claiming that some of the seed will not come up until the second year. We find this to be somewhat the case ourselves. Sweet clover possesses many advantages over the other plants which are commonly used for building up soils. Crimson clover is undoubtedly one of the greatest of these plants, but it is an annual, and requires seeding every year, while the sweet clover requires but one seeding. Winter vetch is also a splendid soil-builder. It is a little high-priced, and the crop is decidedly uncertain in the Northern States unless inoculated, and it also requires reseeding each year. Mammoth clover is one of the best, but it is a biennial, and not so certain to reseed itself as is the sweet clover. Moreover, the sweet clover produces larger plants than any of the other legumes mentioned. Its stalks will sometimes be as large as a man's thumb, and six or eight feet tall, thus producing very large amounts of humus to add to the soil.

We would always bear in mind that it must not be allowed to escape cultivation to fence corners or to other waste places, but if sown and confined to cultivated fields no one need fear it, because one or two years' cultivation will entirely destroy it. I think it possible that many of the men who are laboring over the abandoned-farm question in the Eastern State would be more than repaid for trying this plant, and I think that, if they would apply good-sized amounts of ground limestone to the worn-out fields at the same time, they would accomplish the desired result about as quickly and as cheaply as is possible. And I feel sure that farmers having any kind of soil that simply needs building up will find this plant as useful in bringing it up as any legume that we have. CHAS. B. WING.

Ohio, March 12, 1910.

SOIL SUITABLE FOR SWEET CLOVER.

I have numerous letters from readers of the *Rural New-Yorker* in regard to the seeding of sweet clover and the character of soil best suited to it. Sweet clover will grow on any soil that is not water-logged

if it contains sufficient moisture to sprout the seed. On very thin and worn soils the growth is small compared with that on fertile soils. We use sweet clover to build up thin and much depleted soils—fields that have become useless as pasture—those filled with washes and gullies. These fields generally have a growth of small bushes or briers, where they have been lying idle for several years. These are cut and tramped into the ruts. The tops of the little ridges are dug off and raked into the ruts, which help to hold the briers and bushes in place until they are converted into humus. If the washes and gullies are not too deep the seed is harrowed in with a double A harrow; otherwise the seed is sown early in the spring, just as soon as the soil can be stirred, and about half a bushel of spring oats sown with it. The amount of seed to be sown per acre on fields as described above is 15 or 20 lbs.; on soil that is reasonably fertile, where sown for hay or pasture, 25 to 30 lbs. per acre. Where sown to produce seed, the soil should be reasonably fertile and 15 lbs. of seed per acre sown broadcast, and harrowed in. Sow as early in the spring as the soil can be stirred. For fall seeding, prepare a good seed-bed and sow the seed in October.

Sweet clover for hay should be cut just as the first blossoms appear. If left standing longer the stems become woody, and a great many of the leaves fall off when cured. Great care should be exercised to prevent the hay sun-burning, as this will destroy the palatableness and its nutritive properties. There is no better way to fit a piece of ground for alfalfa than to seed to sweet clover, cut off a crop of hay the first season, and plow under the second season when the clover is about a foot tall; then cultivate with drag and harrow until the first of September, then seed to alfalfa. The sweet clover improves the soil and inoculates it with the nitrogen-gathering bacteria which are so necessary to the existence of alfalfa. When seeding for hay I would not use any nurse crop; and do not cut too close to the ground the first time. Leave five or six inches of stubble to

protect the crown and roots until a new growth is made. If permitted to go to seed the second season, and the seed to ripen, it will reseed itself. The sweet-clover plant lives but two years. It dies at the end of the second season, and its large fleshy roots decay rapidly, admitting the air deep into the subsoil. J. W. G.

Warsaw, Ky.

A PLEA FOR SWEET CLOVER.

What J. W. G. says about sweet clover on page 63 agrees with my experience. One reason that so many farmers condemn it without a trial is that they have seen stock refuse to eat it when green and rank. The bitter taste of the green clover, which sometimes causes stock to refuse it, largely passes away when cured for hay. For hay it grows too coarse to be allowed to stand until in bloom, unless it is to be run through a feed cutter. That which we ran through the cutter was all eaten, although not harvested until beginning to bloom and nearly five feet high. We intend to try it in the silo with corn. Another reason why this clover is not more used is that it is feared as a weed. By cutting or plowing under so that no seeds form there is no danger. Farmers are just beginning to wake up to the fact that the humus in the soil should be kept up as well as the elements of fertility. No matter how rich in fertilizer a soil may be, it can not do its best unless filled with humus. When humus is added to a soil its texture is improved, it is enabled to withstand drouth much better, and nitrogen, the most costly plant food element, is increased. The advantage of sweet clover is that it is so very thrifty and hardy, so well able to get along with poor soil, drainage, and preparation. Some soils are said to require inoculation, but we have not found such.

If there is any leguminous crop equal to sweet clover for green manuring in the cold North "we want to be shown." H. M. P.

Vermont, Feb. 12, 1910.

Frank Coverdale's Experiments and Experience.

SWEET CLOVER.

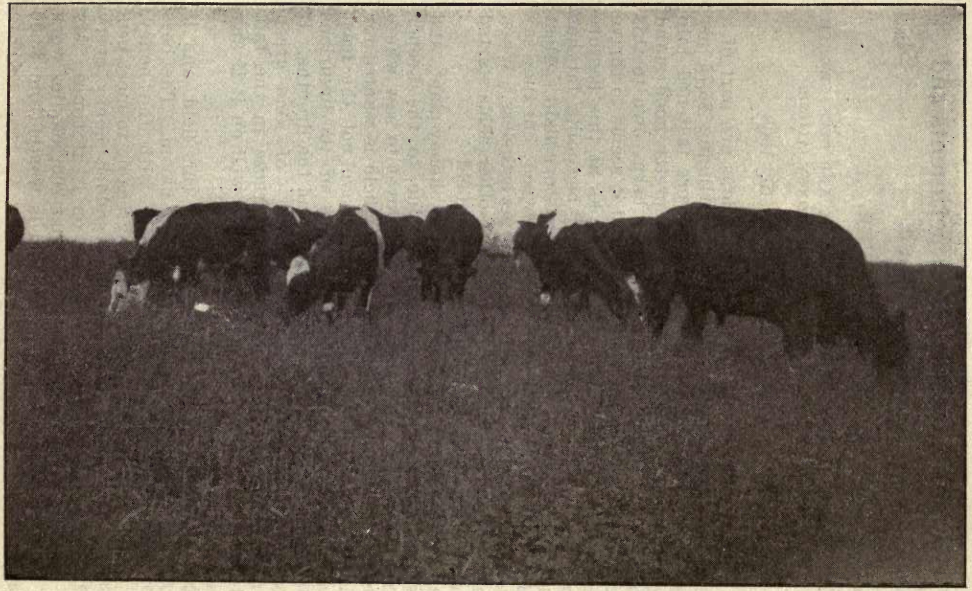
ITS VALUE AS PASTURAGE FOR CATTLE AND BEES; WORTH FOUR DOLLARS AN ACRE FOR HONEY ALONE.

From GLEANINGS for Feb. 15, 1908.

The steers shown in the illustrations are part of a load shipped to Chicago Aug. 1, bringing $5.75 per 100. During June and July they were fastened into this 35-acre field in which was a pretty good stand of sweet clover. This ground has been sown to this valuable legume for four years, and it seems to thrive better each year. No one who looks at this pasture and sees the cattle eating it and becoming fat has any doubt about its value as a pasture-plant. Most farmers think I am growing a vile weed; but they say it makes good feed for the cattle nevertheless. When I want to get rid of it after getting other fields started I guess I shall have to plow up the field.

Sweet clover is certainly a great honey-plant, and this adds very largely to its value to the keeper of bees. It is also the very best clover to sow where a permanent and first-class grazing-field is wanted for dairy cattle, sheep and hogs. I have not the least doubt of its permanency, because of its luxurious growth through both wet periods and the drouths. It always furnishes a large quantity of nice green feed until the ground begins to freeze in the fall. Even after it is frozen the stock do well on it if any is left.

I have 150 colonies of bees near this field, and it is a sight to see it when it is in bloom. The bees keep on filling the supers slowly with the honey, which is water-white, and very agreeable to most people. For me, this clover has yielded honey every season; but the bees do better on it at times. My neighbors keep some bees, so about 200 colonies work on it annually, and yet the field is worth from $3.00



Cattle feeding on sweet clover.

to $5.00 an acre each year for the bees alone. I have made a very close study of this matter.

I think it will not be many years before these bees will have hundreds of acres of sweet clover to work on, and then I expect to see real results. I have seventy acres of sweet clover 20 miles from home, where I never expect to keep bees; for I want only a good rich pasture in this place.

A willow-tree once blew down and broke the fence so that my cattle walked right into my neighbor's hay-field. A ditch extended from my field into his, and the sweet-clover seed had been washed down until it grew along the banks in his field. This neighbor had told me he was afraid it would cover his farm; but my cattle found it that night, and ate it nearly to the ground without touching either the alsike or the timothy. FRANK COVERDALE.

Maquoketa, Iowa.

[In a letter written later, to Dr. Miller, Mr. Coverdale made the statement that sweet clover is worth $4 an acre for honey, $15 an acre as pasturage for cattle, and $30 an acre for seed, when the seed sells near home for $10 a bushel. This makes a total of $49 an acre.—ED.]

GROWING SWEET CLOVER.

HOW TO GET A GOOD STAND.

From GLEANINGS for May 15, 1909.

[Mr. Coverdale has had several years of experience in growing sweet clover for seed, and he is in position to know its value also for stock and for bees. His statements here, in regard to the growing of this clover, are of especial interest because of his long experience.—ED.]

If one wishes to grow sweet clover for the seed alone he will find that it is not profitable, for this plant must be grown for all there is in it. Sweet clover differs from all other clovers, and requires entirely different handling. A good stand for seed can not be secured on poor land in this locality; and even if it could, one would miss every other year, as this plant is a sure biennial. Furthermore, supposing it were possible to get a good stand, and the

field were run for seed only for ten years, there would be only half a stand each year, as the old crop, if it were sufficiently thick, would smother the young plants and make the field very spotted. With fairly rich land there should be little if any trouble in getting a stand; but to grow sweet clover profitably, the field must be grazed during the early part of the season, until July 1st at least. After the stock is taken off, the clover will grow very rapidly, so that a fine crop of seed may be harvested. When the seed is sufficiently ripe, the field should be mown 12 to 14 inches from the ground, so there will be a heavy fall feed for stock after cutting. This is not true of either the red or alsike clovers. Stock thrive on sweet clover better than on any other legume that I have tried, and I have now had six years' experience.

The worst drawback is the difficulty in getting a good stand, as it takes two or three years before a field reaches its best, and during this time it seems like pulling teeth to plow it under, because it is worth too much to plow. However, in managing a field as outlined above, a crop of seed averaging two bushels to the acre can be secured each year, which, with the very excellent pasturage one gets, pays to an extent fully equal to a crop of corn, and there is much less labor.

At the Iowa Experiment Station, last year, five acres were sown to sweet clover in May, and a good stand was secured. The field was mown five inches above the ground, and it yielded one and one-half tons of hay per acre. After this, sheep were pastured on it until winter set in.

This clover should be sown with timothy without a nurse crop. Cattle should be pastured on the field all summer, but not too heavily. The white sweet clover is apt to come up well, and then later get yellow or sick-looking in places. Perhaps one patch ten feet wide will do well, while another a short distance away gets sick, making the field look spotted. If one does not care to keep cattle of his own, stock belonging to some one else might be taken

in. If no seed is wanted, the cattle can be allowed to run over it the whole season; and if bees are kept, a honey harvest will begin July 5th and continue until frost. The bees work on the field like one great swarm from early morning until late at night, and every one who gets a taste of the sweet-clover honey wants more of it.

The white sweet clover should be cut for seed while the stalk is still green; and after the crop is run through the huller the hay will be superior to the best timothy. It is best to work with the crop when it is a little damp, to avoid shelling; and when hauling, spread a canvas over the rack, and occasionally empty this canvas over the middle of the stack.

I am beginning to see that white sweet clover will thrive well anywhere after the bacteria become fixed in the soil, and it will bring up old wornout land very quickly when once a stand is secured, as it produces a great amount of humus, and gathers an immense amount of nitrogen into the soil. In 1907 my sweet clover produced three bushels of seed per acre where the cattle were taken off in the middle of July. There would have been a better yield, perhaps, if they had been taken off earlier; but by so doing the young plants are sacrificed that are to grow the seed for the next season.

Maquoketa, Iowa.

SWEET CLOVER FOR FORAGE.

My enthusiasm runs high over my experiments with sweet clover and I will continue to work with it. The photo shows thirty-five acres of it, which is six years old and you can see that it is a fine field indeed. No other legume could have been sown to hold out and produce so large a quantity of very excellent feed. It produces abundance of greed feed from the last week in April until November, and the fore part of winter if any is left. Looking north you can see seventy rods over this field.

Forty-one 1,200-pound steers had the run of over

fifty acres altogether, and fattened up well, and sold in Chicago for $5.65 a hundred, August 1. I have been shipping the steers from this field each year. $5.75 is the best price I have obtained from steers off this field and that was in 1907, when all were confined to the sweet clover, which seems to produce the best gain and makes the steers very smooth and slick.

Just see how tall it has grown in two weeks, after the steers were taken off August 15. Part of the field was cut for seed about September 1, 1907, and gave three bushels to the acre of nice clean seed. The hay that I have cut is of the very best and both cattle and hogs are very fond of it. I intend to pay more attention to securing the hay crop from this valuable legume.

I sowed twenty acres for hogs last spring and got a poor stand. I have found that this kind of pasture can't be kept for hogs unless all are well ringed, as when fall comes they dig up every root and all is eaten. There is something about the large roots that hogs are extremely fond of. I will ring all the hogs and reseed again in the spring, and it will be a sure thing, for they won't get the roots then.

Timothy and sweet clover thrive splendidly togetner. I consider one acre of this clover, all things considered, worth one acre of corn where one gets a good stand. But here is where nearly all have failed. Many have sown it here and none have a perfect stand. It always does well where it seeds itself on the land and it spreads rapidly over the field when not pastured too hard.

A good catch can be had on ground that will grow fifty or sixty bushels of corn to the acre, and it will be worth just as much to the man who succeeds and uses it right.

It is not a question of whether the sweet clover makes good feed, but whether one can get a good stand that will be strong enough to endure the first winter. Ever after that it will be strong enough to stand any kind of a winter. This clover acts very much as does alfalfa, and from the experience

I am getting now, August may be a good time to sow it, at once after taking of a crop of early grain, by plowing the ground, get in good shape and sow. I got the best stand this way. If I was sowing in spring would sow without a nurse crop and turn on cattle when the clover gets five or six inches high as tramping the ground suits it.

To try to grow this clover for hay alone would be unsuitable as it grows too early and too coarse and gets big enough for hay in May, and can't be cured at this time. So it must be eaten off by stock until haying weather arrives, and then it grows hay of fine quality, and must always be mown about five inches from the ground and managed so as to let it seed some if one wishes to keep the stand, as it is strictly a biennial.

The sweet clover field always affords abundance of fall and spring feed when once established. I like to cut for seed when the seed is a little on the green side, and the straw is better hay than timothy after being hulled. However, I don't consider it anything near as nice to handle for hay as alfalfa, but the hay is just as good. I consider sweet clover especially adapted for grazing and it never bloats a steer. The cattle fill to the highest pitch on sweet clover, but never bloat, a thing of considerable value to me.

When once got on poor land it builds it up very fast in both humus and nitrogen. It usually runs around 22 per cent in protein, and any man who succeeds in getting a good stand will be amply repaid for his trouble.—F. COVERDALE, JACKSON COUNTY, IOWA, IN SUCCESSFUL FARMING.

SWEET CLOVER COMING TO BE RECOGNIZED BY THE AGRICULTURAL PAPERS.

I am making considerable headway with sweet clover in my State. One year ago no farm journal would tolerate the idea of advocating the sowing of melilotus alba; but now, if you read *Wallace's Farmer* you will notice that they advise farmers to sow it under certain conditions, saying it should be taken on trial by all farmers. It begins to look now as

though M. alba were to play a prominent part on every farm in the United States, both where alfalfa is grown and where red and alsike are depended on.

Much good has come from Henry A. Wallace's visit to my field last fall, and that is why he recommends its use as a pasture-plant, and the coming summer I hope to demonstrate its value as a superior hay crop, just as I have done as a superior pasture-legume.

THE YELLOW VARIETY PROMISES WELL.

I am harboring a strong hope that the yellow variety may prove to be of great value to sow in the corn at the last plowing, and then to be pastured the following season or be plowed under the last half of May. If this proves to be good it will mean more to the corn-belt farmer than anything of the kind that was ever brought to light. That is why I want this yellow seed. Yellow sweet clover grows two feet high here by the 16th of May, and could be turned under; and what a fertilizer it would make, and all in time to plant to corn! or if sown with timothy it would make a splendid pasture; or knock down the stalks, and with a binder cut it for seed. It is a proven fact that sweet clover is the best to feed to stock, and that it contains more of the essentials than any other clover. Doesn't the future look bright for sweet clover? FRANK COVERDALE.

Maquoketa, Ia., Feb. 7, 1910.

YELLOW SWEET CLOVER IN KANSAS, ETC.

Yellow sweet clover commenced to bloom here the last week in April. It is in full bloom now, and all kinds of stock like it. As for pasture, sown with alfalfa it prevents bloat. All missed places and alkali spots I sow with it. I have four acres of it. I think it is next to alfalfa for pasture and forage crop. I sowed a bushel of alsike for pasture this spring—the first I have tried. I put it on bottom land. They say it does better there than on upland. The yellow sweet clover does not grow as rank as the white, and makes better pasture. JOHN W. WILSON.

Concordia, Kan., May 11.

SWEET CLOVER AS A FERTILIZER.

From *Hoard's Dairyman*, Aug. 9, 1907.

Valuable as melilot is shown to be as a forage crop, it will rank still higher as a renovator of the fertility of our soil. Being a legume, it shares with other genera of that family in the maintenance of the nitrogen-secreting organisms that enrich the soil. In fact, our alfalfa-growers inoculate their fields with the melilot bacteria to make their plants vigorous and lasting. It has the advantage of its hardiness, adaptability to poor soils, its spontaneous growth, and, most notably, of its remarkable root development.

This last feature is due to its biennial habit. The first year's growth, like the cabbage, beet, and turnip goes to provide a storehouse of food for the rapid second-year growth and production of seed, so that, unlike the other legumes, with their slender fibrous roots, it develops a cluster of fleshy roots which reach several feet into the ground. My own observations afford an estimate of over 20 tons of root growth per acre. From the New York Experiment Station I get an estimate of 28 tons per acre. This root development is unique in the pulse family, and, with the nitrogen-secreting organisms, makes an ideal combination.

The second-year growth is even more remarkable than this. I have taken ten pounds of half-grown herbage from a square yard of surface early in June, or more than 24 tons per acre in less than half the growing season. This is followed by a corresponding crop of seed, which explains its rapid propagation.

But its biennial habit gives it another value as a fertilizer. The dense fibrous roots of the perennials are slow to decay and yield their fertility to the soil, but the long fleshy roots of melilot decay almost as soon as the seed matures, leaving their nitrogen content in condition for immediate use and the soil in the highest state of permeability through this deep penetration.

These marked advantages have been verified many times by observation. They were first noted along the roadsides where melilot first gained foothold. The crop of grass succeeding a growth of sweet clover is always luxuriant. Even beds of sand, which never bear more than few coarse weeds, after a growth of sweet clover were completely covered with a thick sward. In roadway ruts and ditches the bare subsoil is first clothed with melilot which is followed by grass and the ugly gashes are soon healed. Noting the liking of sweet clover for bare spots, the writer sowed some stony hilltops and barren slopes in cultivated fields. A marked improvement was noted in the crops raised on the clover plowed under on these spots.

Clearer proof was noted on a neighbor's field seeded to rye. Here a hatful of seed was scattered upon a ridge in the center of the field. The spring winds blew the rye plants out of the ground, but the sweet clover made a good stand and in the fall covered the ground. Oats followed the rye and on the patch of sweet-clover sod the growth and yield was twice as heavy as elsewhere.

But the best test has just been made by ourselves on a 16-acre field of badly worn soil, the land having been cropped with little change for 50 years and had lately yielded less than half crops. It was seeded with timothy, clover, and melilot. The latter made a good stand only where inoculated by wash from the bacteria-infected roadside, but there it made a fine growth and the first cutting gave four loads per acre. This seeding was kept three years. Pastured the last year, it gave double the feed afforded by adjacent pastures.

Last fall a thin coat of manure was given the weak spots and the sod was turned for corn. Corn was drilled in the well-fitted ground about May 20th and the strong growth thus started was kept by good conditions until the finish. It took 70 pounds of twine to harvest the crop and the yield was taken off at 50 loads; only the lightest has been husked but this yields 120 baskets per acre.

The best ears exceed a pound in weight. While the yield is not remarkable, the change due to the clover enrichment is very great and could hardly have been wrought otherwise at so little cost.

Beloit, Wisconsin. I. M. BUELL.

SEED GATHERING AND SEEDING.

From *Hoard's Dairyman*, Aug. 16, 1907.

The lavish production of seed in this plant makes the securing of this an easy matter. The stems also shed their leaves as the seed matures, leaving little besides the long spikes loaded with the short brown seed-pods. These dry quickly after cutting, and can be easily whipped or beaten off. A roadside patch of a few square rods will often yield seed enough for several acres, and I have whipped off two barrels of the seed-pods in half a day. I usually cut with a hand sickle, and lay in small piles to dry. There is no reason why it should not be secured and hulled in the usual way if one has enough to handle thus, and, when there is demand for it, no doubt farmers will raise the seed as they now raise clover. It is advertised by the leading seedmen under the name Bokhara clover, at about $16 per cwt. One can afford to gather the wayside crop for one-third this rate.

My attempts at seeding with melilot have been very interesting. From the readiness with which it spreads along the highways, in gravel beds, in rubble piles about old quarries, in cuts and ditches, even in June and quack-grass sod, one would look for no trouble in seeding cultivated fields.

But it behaves quite differently in field culture. On new land, or that freshly manured, there is no trouble; and if the soil is too barren to afford any other growth, it will maintain itself; but if the soil is both poor and weedy, the latter will smother the tender young plants even though they make a fair start. I notice, however, that, wherever the surface is subject to overflow from a sweet-clover-covered surface a vigorous growth is maintained from the start, due no doubt to bacterial inoculation.

Its vigorous growth and rapid spread along our highways is due no doubt to the wide dissemination of these germs by the mud and dust of travel. They are also carried by winds and waters over adjacent surfaces, and wherever this occurs the sweet clover thrives.

We need, therefore, to provide both seed and the inoculation of the soil with the nourishing bacteria.

Our alfalfa-growers are advised to gather the bacteria-infected soil from the sweet-clover patches on the roadsides and sow it upon their alfalfa seeding, and doubtless the best way to gain the same end with our melilot is to do this.

As to time and amount of seeding we may follow our practice with red clover. But if one sows the unhulled seed it is safe to follow nature and sow in the fall, leaving the seed to start in the spring.

This in old meadows, pastures, and with fall grains, is doubtless the best time to seed. I have found four quarts per acre of the unhulled seed enough for a good stand.

ITS DISTRIBUTION AND HISTORY.

Although sweet clover is so new to us that very few people have thought of its value as a farm product, a knowledge of its value is as old as history. Its native home is Western Asia, as its name (Bokhara clover) indicates, the same as that of the human race. Its use as a forage-plant seems to have been common from the first. Homer notes it as growing on the plains of Greece and Asia Minor, and tells us that the steeds of the Greeks fed upon it during the siege of Troy. I have been told by men from the East that it is still raised in these lands on irrigated lands as alfalfa is in the West and for the same purpose.

The name "Melilotus," honey-blossom, common to both Greek and Latin, shows that it was well known to both races, and under the name is often noted in classic literature. But by far the best record of this plant is preserved to us by Pliny in his Natural History. He refers to it several times, describes the plant, gives its distribution and uses, and tells more

about it than most of our modern botanists. In his day it was held in high esteem, both as a honey-plant and for its medical uses, and really these latter have been held in high favor by the people of the Continent to the present day.

Numerous species of melilot have been highly esteemed as forage-plants in Central and Southern Europe from ancient times, and most notably in Switzerland, where the flavor and excellence of Swiss dairy products are due in large measure to the presence of melilot in their mountain meadows and pastures. In England, however, though several species are common, conditions do not seem to favor their growth, and they do not afford enough verdure for profitable forage.

It is very interesting to note that our melilot in its new home shows a remarkable increase of strength and vigor. Dr. Asa Gray describes it as growing 2 to 4 feet high in the New England States. Dr. Bailey, in his Botanical Encyclopedia, makes it from 3 to 8 feet high in New York. Here, on the Southern Wisconsin line, I have measured cut stems that were 10½ feet long, and no doubt taller growths may be found along our creek and river bottoms. This apparent adaptation to new conditions may also account for the marked difference in palatability between our stems and that common in the East, South and Southwest.

The use of the bacteria-supporting legumes for the maintenance of the fertility of our farms is one of the most promising fields for agricultural experiment. It is well to know that we have right at our doors the most hardy, rank-growing members of this class, and one that promises the largest increment of fertilizing matter from its growth. I. M. B.

Beloit, Wis.

SWEET CLOVER TO THE FRONT.

From *The Nebraska Farmer*, January 10, 1910.

There was a time when it would be a daring thing indeed to suggest to any farmer that sweet clover had an agricultural value. Even to this day there are

many who deem it a nuisance simply because they have seen it growing where it was not wanted. Any plant is a nuisance when it butts in out of place. The sorriest-looking field of corn we have ever seen was put into that condition by some harmless volunteer buckwheat growing where the farmer wanted only corn. We have been giving considerable attention to sweet clover during the past year, and our efforts have started an avalanche of favorable testimony.

The letter below, from Mr. Harris, of Garfield county, is written to answer those of our subscribers who desire to know more of his methods and successes than was contained in his letter we published a few weeks ago. Mr. Harris is in the border land of the sand-hills country, and his evidence bears out what we have been saying in regard to the value of sweet clover for sandy land. He has no seed for sale, hence his enthusiasm has the true ring, and is not a part of a propaganda to create demand for sweet-clover seed.

GOOD THING FOR SANDY LAND.

I know of only two varieties successfully growing in the United States: the white and yellow blooming. Sweet clover requires less seed per acre than any of the other clovers, and a fine stand can be had by sowing it in the spring alone, or with any of the small grains. It makes good grazing or hay the first season, and it will make a good growth on land that the other clovers, alfalfa, and tame grasses will not grow on to any advantage. It contains the remedy to relieve bloat of alfalfa and red clover.

In letting some young cattle to some timothy and red-clover hay-stacks as well as to some good upland-prairie hay-stacks with sweet-clover stacks in the same enclosure this fall, they did not disturb any of the stacks except the sweet clover. They ate into these quite deeply. When we began to haul hay for the whole herd and scatter it out upon the ground and fill the feeding-racks, the cattle left all other kind of hay for the sweet clover, which they eat up so close you could scarcely tell any has been fed them.

Our horses eat the sweet-clover hay with the same greed and relish as did the cattle. The hired help we had taking care of the stock said he thought sweet clover was unfit for stock; but he knows different now, and is trying to procure some seed to sow on his farm. Mr. Thompson, of the Allerton & Thompson ranch, adjoining my ranch, is growing tame grasses and clovers very successfully on their 50,000-acre ranch here. They have considerable sweet clover also, and will put out considerable more this coming year, as they consider it a very valuable clover.

After having had five years' experience with it in Wheeler and Garfield counties I will say that I have had horses and cattle pasture on it where there was red clover, timothy, blue grass, rye, and native grass; and while the stock let grasses, clover and rye seed, they did not let the sweet clover get more than four inches high; while with only a barbed-wire fence separating, other sweet clover grew six feet high. I have also had the same experience with it as a hog-pasture, and have had the hogs root and eat the sweet-clover roots in the fall and spring, and not disturb the red clover in the same pasture. I have also seen stock refuse good hay when offered sweet clover, and several others have done finely with it here. Alfalfa also does well when inoculated by sweet clover. I consider sweet clover almost as valuable as alfalfa on account of it being very hardy, and reseeds better than any of the clovers. The roots die in two years, leaving fifteen to twenty tons of vegetable matter in the soil. I have had red clover and alfalfa grow four feet high here, while sweet clover has grown six feet high; and could I have only one of these it would be sweet clover.

A test was made with it in feeding sheep in Wyoming a year ago last winter, which gave about the same results as alfalfa. It was not hard to find farmers in Southeast Nebraska twenty-five years ago who declared that they would sooner grow a crop of weeds on their land than a crop of alfalfa, while now many of the same have half of their land in alfalfa, and

wish the other half was also. I fear we often allow our prejudice and erroneous notions to get the best of us, and do not investigate and make actual experiments for ourselves so as to obtain facts and truths that would be valuable to us all.

I have no sweet-clover seed for sale.

Garfield Co. J. S. HARRIS.

SWEET CLOVER IN KENTUCKY.

Editor Nebraska Farmer:—Mr. V. R. Thompson, president of the Brown County (Ohio) Agricultural Society, tells me that the fattest bunch of grass cattle he ever saw came off a twenty-acre washed and gullied hillside near Milford, Kentucky, where sweet clover had taken possession, simply because the land was too poor to grow anything else.

Sweet clover grows along creeks here on sandbars, also on wornout clay by roadsides.

Ohio. C. D. LYON.

Clippings from *Farm and Fireside.*

TO RELIEVE BLOAT IN SHEEP.

A reader at Gibbon, Neb., refers to a former article by Mr. Harris in these words: "In a recent issue you published an article on sweet clover by Mr. S. J. Harris in which he states that 'It contains the remedy to relieve bloat of alfalfa.' Now, I have had trouble in pasturing sheep on alfalfa, and would like to know if sweet clover will prevent bloat when planted with alfalfa, or should the clover alone be used? What is its value as compared with alfalfa as a food for sheep?"

The bitterness of sweet clover is due to a drug called cumarin contained within the plant. It is this drug that prevents bloat when animals are pastured upon sweet clover. Professor Buffum, of Wyoming, is breeding this bitter principle out of the plant; but some friends of sweet clover say they would not have it out of their sweet clover if they could, because it is so valuable in preventing bloat. While it is commonly accepted that sweet clover will not cause bloat because of the cumarin it contains, we do not know, and do not know that Mr. Harris meant to say that a

little sweet clover would prevent bloat if a whole lot of alfalfa is eaten. We are inclined to believe that it might not. The two plants would not go well together, because alfalfa is a long-lived perennial, while sweet clover lives but two years. Alfalfa would scarcely be in good condition to pasture when the sweet clover sown with it would have lived out its appointed time.

As to the relative value of sweet clover and alfalfa as sheep feeds we have only the results of some experiments made at the Wyoming station to guide us in forming conclusions. We quote directly from Bulletin No. 79 of the Wyoming Experiment Station at Laramie:

"Wild sweet clover is common along irrigation ditches and in waste spots; and since it withstands alkali well, and gives a heavy tonnage of hay, it should prove a desirable hay crop in many sections. Stockmen commonly believe that sweet clover is useless as a forage-plant; but cattle and sheep will eat the growing plant if it is not too large and coarse, and the experiment here reported shows that lambs eat the hay readily, and make good gains from it.

"Comparing lots 4 and 5 we find that the sweet-clover lambs made an average gain of 30.7 pounds in fourteen weeks, while the alfalfa lambs made 34.4 pounds gain. The former ate one-sixth more hay, somewhat more corn, and a small amount of oil meal. The larger consumption of sweet-clover hay was due to the fact that it was cut late, and was very coarse and stemmy. The lambs liked it, however, and showed a steady appetite for it. There was not the slightest difficulty in getting them to eat it at the start."

SUCCESS WITH SWEET CLOVER.

From *Farm and Fireside.*

I am so well pleased with experimenting with sweet clover as a soil-restorer and a forage for live stock that I will endeavor to give a few points on its management.

Sweet clover belongs to the family of leguminous plants. The same bacteria live on its roots that live on the roots of the alfalfa plant. Some people will say alfalfa is so much better than sweet clover, why not plant it? How do they know if they have never tried it?

I first used sweet clover as an inoculator for alfalfa.

The bacteria developed much more rapidly in the soil sown to sweet clover than in that sown to alfalfa. The plant of sweet clover does not depend on artificial inoculation or fertilization as does the alfalfa plant.

Another advantage is that the seeding does not have to be done so early. The seed of alfalfa should be sown from the 15th of August to the first of September, if best results are expected. The seeding of sweet clover should be done about the first of October. Four to six weeks are gained for the maturing of crops growing on the land to be sown to sweet clover, which may be corn, tobacco, tomatoes, or other farm and garden crops, while the land to be sown to alfalfa should be broken and thoroughly cultivated before seeding, which requires about four weeks.

The sweet clover yields as much forage as alfalfa, if not more. From analysis, the sweet clover contains the following composition:

Water, 6.86 per cent; protein, 22.55 per cent; crude fiber, 23.49 per cent; carbohydrate, 33.61 per cent; fat, 3.91 per cent; ash, 10.05 per cent, making its feeding value as a forage crop high. Its value as a fertilizing agent in gathering nitrogen can hardly be realized. It has the ability to thrive splendidly on the poorest sandy soil and on dry and badly washed hillsides, where the other clovers would never start.

The seed of sweet clover should be sown thin on old worn fields, then the stalks will be large and heavily branched, producing a great amount of seed. About the first of September the stalks should be cut and placed in the ruts and washes. Then the seed will be scattered sufficiently to set a heavy sod, and will produce a fine pasture the next season. The second or third year after sowing, blue grass will take in this locality and soon be a solid set.

A description of the sweet-clover roots will show that they are a high-class fertilizer. Unlike other legumes the roots are somewhat fleshy and not fibrous. During the first year these roots reach far into the ground and draw up from considerable depth an abundance of plant food which they store up for

the second year's growth. On the death of the plant, at the close of the second year, the fleshy roots decay more rapidly than fibrous roots, and their nitrogen becomes more quickly available for other crops.

My experiments cover the use of the following crops after sweet clover: Beets, beans, onions, parsnips, cauliflower, celery, melons, raspberries, and strawberries. All show a marked advantage on the part where sweet clover was turned under after a growth of two seasons. The color and size of plants, as well as the amount and quality of fruit, were noticeable.

PREPARES LAND FOR ALFALFA.

I think it one of the finest things in use to prepare land for alfalfa. Sow to sweet clover for one year; break the land, turning under the young growth the second spring about the first of June, and cultivate until ready to seed to alfalfa. The germs of bacteria will increase rapidly and the soil will be filled so full that the alfalfa plants will grow right off and make two or more good crops the first season after sowing in the early fall.

As a soiling crop, it is right up to the front. Combined with blue grass it makes one of the finest pastures known to stockmen. Unlike alfalfa, it improves by being pastured, yet again, like alfalfa, the stock have to become accustomed to it before they will eat it with a relish. But, when once they have learned to eat it, they prefer it to all other grasses.

As a pasture for hogs, the chief difficulty lies in the fact that the hogs want the roots as well as the tops. They eat the grass readily from the first, seeming to like its peculiar flavor, and are also fond of the hay, eating it more readily than that of red clover.

Another one of its many good qualities is that cattle may be fed exclusively on sweet clover and under the conditions most favorable to bloating, without any danger from this trouble, cumarin, one of its constituents, the principle which gives it its bitter taste, effectually preventing the fermentation that results in bloating.

Kentucky J. W. GRIFFIN.

SWEET CLOVER FOUND GOOD.

This article caps the discussion of the newly certified merits of sweet clover, which we have presented to our readers in recent issues. Sweet clover has been given a scientific try-out. Prof. B. C. Buffum, director of the Wyoming Experiment Station, has taken it in hand. He has grown it, fed it, tested and observed it, and has thoroughly demonstrated its worth. Furthermore, he has found hope of improving it, and has undertaken the task. Here is his account. —EDITOR, FARM AND FIRESIDE.

Bokhara, or sweet clover has so long been considered worse than useless that there is a widespread and almost universal prejudice against the plant.

Its hardiness, adaptability, persistence, and growing power under adverse conditions are well known; but it is not easy to convince the skeptical that it has any kind of value, or that improvement may make sweet clover one of the most important of all our forage crops. My experience with sweet clover dates back some years and my results with the plant are such that the past season I planted twenty acres of it for breeding purposes and to improve the soil. I have two varieties, and shall attempt crossing and hybridizing in addition to other methods of changing its character and composition.

So far as I am informed, sweet clover first came into use as a forage plant in Mississippi and other portions of the South. Then reports came from Utah that sweet-clover hay was being baled and used for stock-food. In 1903 I visited Big Horn Basin, Wyoming. Here on the "Pitchfork" Ranch, one of the best developed in the West, the owner told me that one year he planted and put up a large area of sweet-clover hay, and that his cattle apparently ate it as well and thrived on it as well as they did on alfalfa. I then resolved to carry out some investigations of sweet clover.

There was an area of land on the Wyoming Experiment Station farm which lacked drainage, and where the accumulation of alkali salts had destroyed a stand of alfalfa. This ground was covered with a menacing growth of what Western stockmen call "foxtail." This is not the tame foxtail of the East, but more

properly a wild barley called "squirrel-tail grass" in the older botanies. It grows in waste places, or sometimes in meadows, and the beards cause much trouble to stock eating hay contaminated with it. I planted four acres of this land to sweet clover in spite of the protests of friends that I should be mobbed for introducing and fostering what to them was only a dangerous weed. It was planted late, and in the short season made no growth that could be harvested the first year. The next season, however, I cut two crops, and put up four small stacks of the hay. The yield of cured hay was 2½ tons to the acre. One-half the hay was salted with seven or eight pounds of common salt to the load as it went into the stack.

The assistant head of our live-stock department was requested to make feeding trials with sweet-clover hay that fall; but either his own skepticism or some other cause prevented the order being carried out, and my sweet-clover stacks perfumed the air through that winter and the next summer and fall before the feeding traits were actually organized. I must pause here to note the first beneficial effect of growing sweet clover. In the two seasons it had cured the land of foxtail, and apparently did some good to the alkalized ground as well. Sweet clover is a weed-eradicator and nitrogen-gatherer worthy of wide and extended use. Our station-chemists' analyses, I remember, gave as high as twenty-three and eight-tenths per cent. crude protein; the others gave fifteen and nineteen per cent. At the same time our high-altitude-alfalfa hay was showing more richness than other alfalfa, with about sixteen per cent. protein and high digestibility. Our richest sweet clover was higher in protein than any other roughage, and showed one condition to be avoided. Care must be taken not to give too much of it, as stock may become cloyed and go "off feed" from overfeeding.

When given to the lambs on experiment, the hay was eaten with great relish, even the coarse stems being readily consumed. My men fed carefully, and lots of ten lambs each were fed on sweet clover, compared with alfalfa and with native hay; lambs fed

the same corn ratio. It is sufficient for present purposes to state that the butcher who dressed the lambs testified that the sweet-clover-fed lambs were the fattest and finest carcasses he ever handled, and a photograph of the dressed meat showed much superiority of the sweet-clover lamb over lamb fed native hay. The alfalfa lambs gained 34.3 pounds per head, a little less than four pounds better than the sweet-clover lambs. That is, sweet clover offers a substitute almost, though not quite, of the same feeding value as alfalfa, where the latter is not available. Perhaps a portion of the success was due to curing the hay in the stack a year before being fed. The people of this country have not appreciated the value of time in curing hay. I am told that old-crop hay usually brings a premium in the haymarkets of England. The evidence is conclusive to me that sweet-clover hay, properly grown, handled, and fed has a value worth while—at least in many localities where the plant will thrive and where alfalfa does not do well for any reason.

Perhaps no plant has a higher value as a fertilizing agent. Soil from sweet-clover land is useful in inoculation for alfalfa with nitrogen-gathering bacteria. So impressed have I become with sweet clover that I have taken up the task of its improvement by plant-breeding. I believe it may be made to lose a portion or all of the cumarin, which is the bitter-sweet principle that makes it unpalatable to stock; and perhaps it may be possible to change it into a perennial.

The seed I bought for sweet clover at 18 cents per pound was adulterated with alfalfa seed, so I have a stand of about half-and-half sweet clover and alfalfa. However, this will not be a serious disadvantage and I have hopes of getting quick results in improving sweet clover, both in palatableness and yield.

Any one who wishes to plant sweet clover for hay or soil improvement can get seed from almost any reliable seedsman. I recommend planting fifteen or twenty pounds of hulled seed to the acre. It may be sown broadcast if the seedbed is moist and fine, or,

better still, plant with a press drill not more than an inch or two deep. For hay it should stand thick and fine-stemmed, and be cut before it comes into full bloom. The green hay is quite succulent, and needs to be cured in small cocks, allowing it to get pretty dry before stacking, and then use salt as indicated above. Sweet clover is a biennial plant, and will all die the second season if not allowed to seed itself, so it need never become a bad or persistent weed.

B. C. BUFFUM.

Several points regarding sweet clover have been raised by interested readers. There is some doubt regarding its blossoming habits. In the North it is a biennial, seldom forming seed the first year. In Kentucky and further southward, however, correspondents tell us it will seed the first year with them, unless cut twice.

One farmer writes: "It does best on a soil containing a good deal of lime." Generally speaking, it seems to grow on almost any soil not too boggy or too sour. A writer in the Ohio Farmer has had different experience, however.

"It is rather more difficult to secure a stand and crop of sweet clover than of alfalfa. As I have intimated, it often comes of its own free will where it is neither expected nor desired; but repeated efforts to start it where it has been wanted have uniformly resulted much less successfully than similar attempts with alfalfa."

That paragraph sounds a sensible warning to those who are figuring on sweet clover to do too much. As the writer further states, however, some of the unreliability of stand may be due to unreliable seed. Sweet clover is hardly a standard market article as yet. While most seed-houses carry it, many of them have never found it worth while to catalog it, owing to the slim demand. The plant has been so little grown, commercially, that good seed is hard to get. A germination test is well worth while before planting.

We have a lot to learn about sweet clover. This much is fairly certain now: It is a first-class soil

renewer. It will grow in many places where alfalfa will not. It serves to introduce alfalfa. When grown and cured right it makes a feed that stock will not only thrive on, but relish. As far as feeding value goes, it runs alfalfa a close second. As long as we do not make a fad of it, we believe it is destined to do many fine things for farmers. EDITOR.

SWEET CLOVER: ITS WORTH AND ITS CULTURE.

MELILOTUS INDORSED AGAIN.

From *Farm and Fireside.*

Sweet clover (melilotus) meets the approval of every farmer in this neighborhood as a valuable pasture and a soil restorer. For sheep, cattle, and horses it is hard to equal, and its blossoms are also fine for bees. A neighbor who has been in the bee business thirty years says his bees produced 150 pounds of honey in one season from one stand. This may seem an unqualified statement, but it is well vouched for.

This clover thrives on some of the poorest soils here in Southern Indiana. Nothing surpasses it for bringing back fertility to the soil in the shortest time. The roots of the plant the second year go to a great depth, making them a high-class fertilizer. On the death of the plant at the close of the second year the roots decay and the fields can be plowed at this time or come again from the seed.

If thrashed, sweet clover gives fifteen bushels of seed an acre, now selling at three to six dollars a bushel. If the plants are plowed under, my experience has been that the land, after two or four years, is left in shape to produce fifteen hundred pounds of tobacco to the acre, of the finest quality. I believe every farmer who owns hill ground or land that is not suitable for alfalfa will be justified in giving this clover a trial. J. R. CRAIGMYLE.

NEW LIFE TO WORN SOILS.

My first planting of sweet clover as a soil-maker was on an old, worn, and almost completely exhausted

field, one that had been thrown out in the commons. A five or six years' growth of scrub oak and sassafras bushes covered the ground where the washes and gullies were not so numerous as to prevent their growth. The soil, geologically speaking, once was a clay loam (now all gone). The subsoil was yellow clay underlaid by a stratum of clay, sand, and gravel. I give this full description of the condition and the character of the soil because there are so many similar farms in the same condition, not only here in Kentucky, but through the whole Mississippi Valley, north and south, and there are so many farmers who might be benefited, if they only would be, by sowing sweet clover.

The oak and sassafras bushes were cut and piled in the gullies; the top of the brush was laid up the hill so that the forks of the little limbs would catch the trash. This would catch other trash and earth, which would fill in around the larger brush and soon fill the gully. The backbones, or little ridges, between the gullies were dug off into the gullies and tramped hard on to the bushes. The larger ridges were plowed and harrowed, then the entire field was sown in the spring to sweet clover and blue-grass.

The sweet clover came up nicely the first season; but the blue-grass did not come up until the second; then the sweet clover was tall enough to shade the tender grass through the heat of summer and to protect it through the winter. At the end of the second season, when the sweet clover went to seed, there was a growth of the sweet clover fully six feet tall, and heavy enough to hide a sheep any place in the field. The blue-grass was five or six inches tall, but thin on the ground. When the ground was dry, during the fall and early winter, this field was pastured with a few mules and horses. In feeding on the grass they trod down the dead sweet-clover stalks, which served as a mulch to the seedling sweet clover, and prevented the ground from washing. At the beginning of the third season a fine crop of the sweet clover came up, which with the blue-grass made fine grazing.

The amount of (hulled) seed to the acre, for hay, is thirty pounds; that for pasture and for green manure, as in cases like the above, is fifteen pounds. As the stems or stalks of sweet clover become hard and woody, when thoroughly developed, it is necessary, to secure good hay, to sow the seed so thickly that the plants are dwarfed. But for building up old fields, and to seed to pasture, we want a large growth of plants which will give us the largest amount of seed the second year and large stalks to protect the young grass; hence we sow less to the acre.

I have tried spring, summer, and fall sowing, and found very little difference, as the seed germinates slowly, when sown at any time. If sown in the spring I would advise sowing with it a light seeding of spring oats. I have found that, to follow along Nature's lines in seeding, or, in other words, to sow the seed of grasses just after the time of the ripening of the seed, will give a good stand, other conditions being favorable.

Where grown for hay, sweet clover should be harvested twice the first season. It will not go to seed the first year if it is cut twice. Where it is cut twice the second season there is very little seed formed. The plant of sweet clover dies at the end of the second season.

Sweet clover should be cut a little earlier in its growth than alfalfa, as the stalks are more of a woody nature. Just before the first blossoms appear gives the best quality of hay.

The great difficulty with sweet clover has been its unpalatability to stock. In grazing on young plants, however, the stock begin on it when other grass is short, and they gradually become accustomed to it. I note in particular that horses, mules, sheep, and cattle take to it readily, when turned on it during a dry time when pasture is short. It is not affected by extremely dry or hot weather, as are other pastures.

There is quite a difference between the palatability

of the tender green plant and the cured hay. The plant develops the bitter or acid flavor when about half grown, or about the time to cut for hay. If, however, the sweet clover is mixed with other hay in feeding the stock at first, they will soon develop a taste for it, and will prefer it to other hay.

There is quite an advantage in sowing sweet clover with alfalfa, ten pounds of sweet clover and twenty pounds of alfalfa. The stalks of the sweet clover hold the alfalfa from falling, and the mixture makes a splendid hay. J. W. GRIFFIN.

FURTHER TESTIMONY.

A few weeks ago, while taking a buggy-ride through this county, my traveling companion pointed to a lot of dry weed-stalks lining the roadside and said: "I wish the highway superintendent would have those cut when they ought to be cut. They are the worst weeds we have."

"Not so," said I, "but one of the most useful weeds we have, and one holding much promise, but never a pest." It was sweet or melilot clover which here, as in many other sections, is found in great abundance on roadsides, railroad embankments, and waste places. It covers such spots with thrifty verdure, furnishes bee pasture for many weeks, and, if we only knew how to handle it just right, it would be serviceable for other useful agricultural purposes.

Years ago I called attention in these columns to melilot clover as one of our most promising cover crops and soil-renovators. It gives an astonishing lot of green stuff in a surprisingly short time, and it draws nitrogen from the atmosphere equal to vetch and alfalfa. In its earlier stages, sweet clover closely resembles alfalfa, and from the looks of both I should think that there might not be much difference in the taste. One of my cows, when tied out in a meadow, ate the grass down well to the ground, but left the alfalfa-plants untouched, just as another in another patch left the sweet-clover plants, until the one became used to the taste of alfalfa and learned to eat sweet clover. I find my cattle will eat alfalfa and

sweet clover, cut young, as well as vetch (another plant at first rejected) with apparent relish.

I am glad to see the real merits of melilot clover more and more appreciated, as may be seen in the columns of recent issues of FARM AND FIRESIDE and other agricultural papers. Hundreds and thousands of acres in the suburbs of our cities, and other unoccupied lands in their vicinity, are annually covered with a dense mass of sweet clover, and all of this is allowed to go to waste, as may be seen by the dead and leafless stalks every fall. If cut in proper season it might be utilized for food for horses, cattle, swine, and poultry in the closed season. It has the same food value as alfalfa meal. When the sweet-clover plant gets old and tough and woody, and loses its leaves, it has also lost its feeding value. Secure it in time. T. GREINER.

SWEET CLOVER IN ALFALFA MEADOWS.

From *The Ohio Farmer.*

In buying Western alfalfa seed one is pretty apt to get a small proportion of sweet clover along with it (*Melilotus alba*). It had not occurred to the writer to mention the presence of sweet clover in alfalfa seed; but as he now recalls it he can not remember an alfalfa-field established upon Woodland Farm within recent years where sweet clover did not appear in greater or less amounts the first year. Some of it will even show the second year, but after that it is seen no more. Sweet clover is a biennial, and can not endure mowing off. If not allowed to mature seed it is soon extinct. It is hardly right to classify sweet clover with weeds, since it is a splendid soil-enricher, one of the most energetic nitrogen-gatherers known, and it carries the same nitrifying bacteria that alfalfa does, and is thus a direct benefit to a young alfalfa-field, since it pioneers the way and makes the alfalfa that succeeds it thrive all the better. However, one should mow it off at least two or three times in a year, and that will prevent its seeding and becoming too plentiful.

Sweet clover in the South is much used as a sheep and pig pasture. It is greedily eaten there when it

comes up first in the spring. It makes a hay too coarse and woody to be relished by most animals, and has also an odor that seems too strong for Northern stock. It is a splendid bee pasture, however.

I mention these peculiarities about sweet clover so that men getting a little of it in alfalfa seed may not be frightened. They should go on as though they had none of it. Their alfalfa-meadows, in order to succeed, will need to be cut at least three times a year, and that will vanquish every bit of the sweet clover.

CHARLES B. WING.

Champaign Co., O.

SWEET CLOVER.

F. L., Gallia Co., O., writes: "Will the Ohio Farmer give experience in growing sweet clover—best time and manner of seeding, etc.? State where seed can be had. I have heard that it is a good crop to precede alfalfa, and wish to try it with this in view; also as a pasture crop for hogs."

A subscriber from Brown Co., O., also writes: "I have read quite a lot of late concerning sweet clover. Please advise what you know about this legume. Is it more sure to make a catch than red clover? Is it best for pasture or hay? I see it growing along our roadsides, apparently untouched by live stock."

There are a great many different species of legumes passing under the name of sweet clover, some of which are of little or no value. The most common as well as the most valuable species in the central States is *Melilotus alba*, known variously as sweet clover, bokhara, large white clover, melilot, and white melilot. This is widely distributed over the United States, growing quite freely along roadsides and waste places. Under these conditions it is hardy and persistent; but let it once understand that its presence is desired—that is, prepare a good seed-bed for it, and nurse it, and it is affrighted!

I should perhaps state that *Melilotus alba* is a biennial, resembling alfalfa not a little. Indeed, up to blooming time it is not unusual to mistake one for the other. It is three-leaved, erect, and somewhat

coarser than alfalfa. Its blossoms are slender and white, rarely appearing until the second year. It has a characteristic odor, and is not liked at first by live stock. Undoubtedly its greatest value is as a soil-improver, although it is claimed that stock can be accustomed to it so that they will eat it with some relish. Chemical analysis shows it to be similar in composition to alfalfa. I suppose that, in spite of this fact, they may seem to be as far apart as diamonds and charcoal (both having the same chemical make-up) to the ultimate consumer.

Unquestionably sweet clover is a desirable crop to precede alfalfa, since the bacteria which work upon the roots of sweet clover also work upon alfalfa; but if our correspondent's experience should be anything like the writer's he will find it rather more difficult to secure a stand and crop of sweet clover than of alfalfa. As I have intimated, it often comes of its own free will where it is neither expected nor desired; but repeated efforts to start it where it has been wanted have uniformly resulted much less successfully than similar attempts with alfalfa. Accordingly, I can hardly recommend it as a John the Baptist for alfalfa. Nor do I think it anywhere near as sure a crop as red clover.

One great trouble, perhaps the greatest, is to secure good germinable seed. Just why this is true I won't attempt to say. I have tried many different seedsmen, and it is only rarely that I have succeeded in getting hold of seed one-half of which would grow. I would suggest that, before purchasing seed, our correspondents ask for small samples and test them for germination.

As to time of seeding, it is probable that June, July, and August are as satisfactory months to seed sweet clover as any. I would sow 15 to 20 pounds of hulled seed, or half a bushel of unhulled seed per acre, on a clean moist seed-bed, harrowing it in, as one would alfalfa. It may also be seeded in corn at the last cultivation with some degree of success where the ground is full of humus, and moisture conditions are favorable after seeding. It is of doubtful utility as a

forage crop; but as a catch or cover crop it may possibly become of some moment. It should be stated that it affords excellent pasturage for bees.

SWEET CLOVER AS A FORERUNNER OF OTHER VEGETATION.

We have sweet clover growing in abundance on our roadsides here, but I have not observed any instance where it is growing to any extent in cultivated fields. When I was a boy our roadsides were covered with many weeds. They were generally pastured down into the ground with sheep and cattle. Later, ragweed grew abundantly. Some 12 or 15 years ago sweet clover commenced to grow in patches. It was undoubtedly distributed over wide extents of territory by the wheels of vehicles and not by any hand-sowing. Now I notice this: Where the clover has grown thick for a few years it seems to die out and give place to our natural bluegrass. In other words, our friend the sweet clover (melilotus) has performed its mission—that of growing upon and enriching an otherwise barren soil, leaving its legacy, the nitrogen nodules, which are said to be the same as on alfalfa. Who would not rather drive along a road with the perfume of the sweet clover coming to him from both sides than the hay-fever-promoting ragweed pollen?

Lenawee Co., Mich. ABNER WILSON.

YELLOW SWEET CLOVER SOWN IN NOVEMBER, AND IN FULL BLOOM THE FOLLOWING JUNE.

June 14, 1909, Mr. Philip Bohley, a man in our employ, brought me a stalk of yellow sweet clover 5 ft. tall, covered with bloom. He said the plant came from seed that he sprinkled along the roadside in November the fall before. He did not notice whether the seed came up in the fall or not. All he could say was that there was no sweet clover in that place the year before. The circumstance was so remarkable that myself and Ernest took a trip there to see it; and the picture adjoining is supposed to be myself standing among the sweet-clover plants. I took off my fur cap and donned Ernest's hat, and that is one reason why I do not look natural.

The matter was mentioned in GLEANINGS for July 1, 1909, page 418, and I then inquired if anybody else had secured a successful stand of sweet clover, either white or yellow, when the seed was sown as late as November. Several letters informed us that the same thing had been done by sowing the seed in August and September, but none as late as November. Mr. Bohley says the horses grab for it every time they go past it. Remember this seed was not in cultivated soil, nor had any effort been made to cover the seed in any way. It was just scattered along the roadside adjoining his own premises. If this thing can be duplicated it would seem to indicate that yellow sweet clover will furnish a large amount of good food for stock, or for plowing under, in a shorter time than any other legume *or anything else.*

June, 1910. A. I. ROOT.

Table of Contents.

(Continued from page two of cover)

Poultry, for 93
Preparing the ground for sowing other crops..... 75, 84
Preparing land for alfalfa 5, 63
Preventing honey from granulating 46
Quality of honey from 14
Railway banks, sweet clover on 61
Restorer of poor soils 88
Roads, for making 13, 32, 33
Roots of for pigs 79, 83
Roots of sweet clover for pigs..... 74, 80
Roots, value of 73
Roots, 28 tons per acre 72
Rural New-Yorker, clippings from 52
Seed required per acre.....9, 86, 90, 94
Seed, imported 4
Seed, gathering 69, 75
Sheep, for 5, 40, 79, 80, 93
Soil-renovator, sweet clover for..... 91
Sowing, time for 82, 90
Stand, difficulties in getting a good one..... 68
Stock learning to eat sweet clover 28
Sweet clover nine feet tall 48
Tap roots, enormous 55
Ten feet high 77
Thrashing out the seed 16, 17
Unhulled slow in germination 46
Utah for sweet clover 35
Value of per acre for honey 42, 43, 49, 65
Value for hay 85
Value for milch cows..... 35, 36
Weed, noxious, is sweet clover ever?..... 3, 43
Winter-killing 7, 8
Yellow sweet clover 14, 15, 17, 41, 45, 72

YB 46479

497822
Root SB205
C64R6

UNIVERSITY OF CALIFORNIA LIBRARY